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XV FEBRUARY, 1925 No. 2

AMERICAN JOURNAL OF PUBLIC HEALTH

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Published monthly at 372 Broadway, Albany, N. Y.
Address Editorial Matter to 370 Seventh Ave., New York City

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American Journal of Public Health
Official Monthly Publication of the American Public Health Association

VOLUME XV FEBRUARY, 1925 NUMBER 2

NURSING FOR MATERNITY AND CHILD HYGIENE*

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THE mother and the child are the center of any plan which has to do with life, its protection and its equipment for service. It is a matter of the utmost importance, therefore, for those who are interested in public health, especially the form of it to which I briefly refer, to keep in sympathetic touch with them. How can we reach mothers? How can we reach children? How can we impress upon both the possibilities within themselves that make for health and happiness, or, on the other hand make for the wreck of both? These are matters worthy of our most earnest consideration.

Today the world is full of agencies specializing on many different lines of health activities. I think it is a mistake and am quite sure from my own experiences that we specialize too much. Often we are duplicating and wasting time and energy and sometimes I fear we tire with our iteration and repel with our officialdom. In this work we should remember that we have but one aim, to reach mother and child in an effort to interest and help them. We should, therefore, brush aside every obstacle that interferes with or negatives that purpose.

The most valuable work in maternal and child hygiene can be carried on only in the home. It may be begun elsewhere, but it is in the home that the lessons are practiced and applied. Therefore, the means of access to the home is a matter for serious consideration and very definite planning as well, for the home is the citadel to be taken. This may be accomplished through the child, reaching him at the school, the place where children congregate.

The school nurse, in the course of her duty, meets children and examines them as well. Often in these specializing times she does nothing more, hence, my plea against confining health work to any one specializing line. Rather extend the work; widen it and give to a nurse only such territory as she can thoroughly cover. If the nurse's work begins at the school and ends there, it has missed the greater part of its potential value, for to a properly trained nurse with vision, enthusiasm and altruism, her work at the school is just an open door for much more important work outside of it.

The child will open the door of any home for any nurse who is qualified to enter it. But the nurse must enter such homes on terms approaching social equality, never as a fault finder, or picker

* Read at the Joint Session of the Public Health Administration and Public Health Nursing Sections of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 21, 1924.

of physical flaws; never as a superior being, nor as an official, but just as an interested friend, anxious to help.

After years of experience, I have failed to find a case in which these points being observed, the nurse has been unable to secure entrance. I have a recollection of a case earlier in my experience where the nurse failed to find entrance for the moment, due to misunderstanding on the part of the mother and the fear that she was an official spying out the weak spots in their home conduct and defenses. But with understanding on the part of the mother a little later on, which by the way came to her through her children, that same nurse was invited to their home and was thereafter a welcome guest.

True, the nurse is an official; yet, she should not bear the label, and should never show it in her conduct, manner or appearance, with the exception that while an official duty in the school, or when engaged in bedside nursing she should wear the simple uniform of the nurse, which of itself gives a valuable lesson in hygiene.

Having found entrance to the home as the friend of the children on terms of social equality, the task of the nurse can be made a very light one in so far as impressing her advice upon the household is concerned. The children have found a friend. Most mothers like the friends of their children, and advice given to mothers and children about themselves is bound to have a salutary and far reaching influence in leading mothers to seek advice regarding such of the children as may be under school age, and to seek personal information that will make for the well being of the child yet unborn. And so the process of health education has progressed downward from school to preschool ages, and from postnatal to prenatal periods.

Prenatal care is one of the most far reaching in its benefits of any service that can be given. It often spells present safety for the mother and means life, health and good citizenship for the unborn child. The only place in which that service and advice can be properly given with any certainty of its absorption or with any guarantee of its adoption is to the expectant mother in her own home.

And yet, it must not be forgotten that such work does not ordinarily fall within the scope of the school nurse's duties. In doing these helpful things in the home she exceeds her school duties and becomes a prenatal worker.

Sometimes it is the privilege of a nurse to be present in a community or even in the home when a new life comes to it. Always in such an event she is called upon to give first nursing aid. Sometimes she saves the life of a mother; often she saves the life of a newborn child. This service of good will assures to her a welcome forever after, not only in that household, but in the neighborhood as well. She has given advice, but far beyond that she has given help and has exemplified in action that great parable of the traveler robbed and injured on his way to Jericho. She has been a veritable good Samaritan, and has made her profession and work live up to the sublime teaching of that parable, giving human aid where there was human need.

In another home she finds someone ill and suffering, remote from a physician. In such cases the school nurse gives nursing aid. She shows friends of the patient how to carry on until the physician and the bedside nurse arrive, if these are available, or until the patient is removed to a hospital. Or, if an accident has taken place, the nurse is called in and gives first aid until the physician arrives, doing her best to bring comfort and minimize pain. Best of all, by her prompt action she may succeed in saving a life. These are not strictly the duties of a school nurse, for she is doing bedside nursing and giving first aid, and is equipped to do both.

Sometimes in the visits to the homes of her school children, the nurse comes to a home where someone is the victim of the white plague, and sometimes

where the individual is living amid surroundings and in home conditions so insanitary that there seems small hope of recovery unless both of these are much improved. In many such cases she finds an added menace to others in the home, the danger of contracting the disease by contact. Here it is the nurse's mission while giving nursing aid, to point the way to hope and health for the sufferer by advising fresh air, sunlight, rest and perhaps the sanatorium, as well as to issue instructions to the other inmates of the house. She demonstrates practical sanitation and cleanliness. Here the school nurse is doing the duty of a T. B. nurse and sanitary officer, and in a home where neither of these might find the opportunity for service.

Sometimes she is called upon by the women of a community to form a class on home nursing and first aid. She organizes such a class and with or without the assistance of another member of the staff called in for that special work, gives a definite course of lectures, with practical demonstrations to illustrate her teachings. This course lasts for ten days or more according to the size of the class, and is of great value. But since valuable things are not to be wasted, she gives this course only on request, and providing the membership is sufficient and the attendance regular. Now our school nurse has developed still further, and has become an educator and instructor.

Another very important task for the nurse is the social service work which she carries on. It is her duty to visit not only some of the homes, but it is further emphasized that it is her duty to visit every home in the community. This gives her the unique and splendid opportunity to study home conditions in all walks of life, to report upon them, and where necessary to secure for the needy, without the stigma of official charity, the help they need to bridge them over to the better days that are to come.

But all teaching and instruction requires iteration and reiteration, and there is need for a place where such instruction and teaching may be given. This is provided for by our welfare stations at the various rural centers where the nurse makes her headquarters. In connection with most of these there is a rest room for women. It familiarizes every woman with the location of the welfare station as well as the work the station is doing, and gives the opportunity for spreading the news of the station's beneficial activities in her own district from the knowledge she has derived. To these welfare stations mothers bring their children for examination from near and far, and just as often as the nearness or the remoteness will permit. This plan has worked out admirably.

A further work that our nurse engages in is the inspection of all children's homes and maternity homes, those in the province of Manitoba being under the jurisdiction of the Provincial Board of Health. A still further duty is the examination of all school children leaving for summer camps, so that none may go there as carriers of disease.

Then there are the baby conferences and clinics held in various rural centers at fair time, mothers bringing their babies for examination by a physician devoted to that work. Here too, both mother and nurse see the fruition of the work; the nurse of her teaching, and the other of the application. There is such a round of these conferences that several nurses are kept busy for some weeks during the summer holidays.

It is to be remembered that the nurse is concerned with a baby conference, and not with a baby show, where clothes and good looks rate high, and sometimes health and physical fitness rate low. This procedure is much too serious and dignified for a show. It is a demonstration to all onlookers of the essentials for keeping a baby well and favoring a normal development into stalwart manhood, or beautiful and healthy womanhood.

And so you will see that the nurse who does all this, is not merely a school nurse,

not a T. B. nurse, nor a social service nurse. She is all these combined and more still. By what name then should we call such a nurse? We cannot give her any one of the names which mean just a special line of nursing activities for that is too limited. But we can give her a name that will include all these activities and will permit her to carry on all these duties. We should call her "A Public Health Nurse," and the name should be confined to those who carry on such duties. Such a nurse, in addition to her attainments which fit her for the work, must have qualities that will endear her to a very special clientele—the children and their mothers, as well as to the general public. Officialdom must not be conspicuous, for in the homes of our continent such officialdom has no place, and often succeeds only in placing the ban on some work that would have flourished without its approval.

Finally, I hope to see the time when in addition to the duties already enumerated as rightly belonging to her, this nurse will have still another duty added: that of bedside nursing within defined limits. This would mean for me the attainment of an ideal which I have long cherished as to the work that a public health nurse should carry on. My conception of such a nurse is one who has a very special interest in maternal and child hygiene, because these are the beginnings of all effective health work in a community, one who should give service in the wider fields indicated, and be given a district small enough to permit her to do all this effectively.

CAN DIPHTHERIA BE ELIMINATED?*

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District State Health Officer, Syracuse, N. Y.

AS STATED by the writer at the Boston meeting of this Association last year, an intensive campaign for Schick testing and immunization against diphtheria was begun in the City of Auburn in February, 1922. The purpose of this campaign was primarily to reduce the morbidity and mortality from diphtheria which was becoming a serious menace to the children of that city, and secondly to demonstrate the value of this procedure in a city of this size. Auburn, with its 36,000 inhabitants representing 31 nationalities, its variety of industries, its wide range of home conditions, presented to us a typical city for such a demonstration.

It was evident to us from the start that if this demonstration was to be of value to other communities an accurate system of records must be kept. For this purpose a card index of each child Schick tested and immunized was kept on file at the local laboratory; also a complete list of all the school children immunized, with the dates of Schick testing and immunization was furnished to the teachers of each school grade.

By various methods of publicity we were able to secure the parents' signatures to consent blanks for Schick testing and the giving of toxin-antitoxin to the positive reactors of 58 per cent of the enrolled school children in our first demonstration. This work was done between February 9, 1922, and March 17, 1922. Our records of diphtheria at the end of that year gave results which were most striking.

By using the 42 per cent of the school children, from whose parents we did not

* Read before the Laboratory Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 20, 1924.

receive consent for the immunization as a control, our records showed that 80 cases of diphtheria resulting in 13 deaths, occurred among these children while among the 58 per cent which were either negative on Schick test or had received the three doses of toxin-antitoxin there were but 5 cases of laboratory diphtheria, all but one of which proved to be cases of Vincent's angina occurring in diphtheria carriers, and no deaths occurred among this number.

A second campaign was instituted in the spring of 1923, in which we were able to raise the percentage of those immunized or negative Schick reactors from 58 per cent to 73 per cent of the total registration, leaving only 27 per cent who had not received the treatment.

During that year there occurred 15 cases of diphtheria, resulting in one death among the 27 per cent not immunized. In the 73 per cent of immunized children there occurred 2 cases of laboratory diphtheria, both of which proved to be Vincent's angina in diphtheria carriers, and one death the cause of which was questionable.

In the spring of 1924 we secured an additional number of consents and were able to raise our percentage of treated children to 85 leaving only 15 per cent of the school children who had refused treatment. Since this demonstration there have been but 3 preschool children and 3 school children reported with diphtheria among the 15 per cent, and no cases and no deaths among the 85 per cent representing the treated children.

There has been but one death from diphtheria in the City of Auburn during the past fifteen months, and this death occurred in a child two and one-half years old who had not been immunized. There were 5 other children in this family who had received the treatment, none of whom had the disease. It will thus be seen that we have nearly accomplished what we planned to do, namely, eliminate diphtheria from the schools of Auburn by this procedure.

During the past school year there were no cases of diphtheria among the school children whom we had immunized, and 7 cases and no deaths among the children not immunized.

During the four years just previous to our work, there had occurred in the City of Auburn a yearly average of 104 cases of diphtheria, resulting in 14 deaths each year, with an enormous loss of school attendance due to quarantine from this disease.

The question may be raised as to whether this dropping in the diphtheria case and death rate was not a natural drop in the disease incidence. This is not true, for during the past five years cases of diphtheria occurring among the adult population of Auburn have not materially changed. The adult diphtheria previous to the beginning of our work was only a fraction of the total number of cases in the city, while during the past year the adult diphtheria cases have outnumbered both those of the school children and the preschool children. This is similar to what occurred following vaccination against smallpox. Previous to the days of vaccination smallpox was considered to be a children's disease. Since general vaccination it has become an adult disease. May we not expect that the same thing will occur with general immunization of children against diphtheria?

We have immunized about 700 preschool children in the City of Auburn, which evidently has been a great factor in the reduction of diphtheria among the children of this age.

It has been suggested that the proper age to give immunization doses is from six months to five years. Theoretically this is true, and I think eventually will be the plan adopted. However, our work plainly shows that undoubtedly the largest source of infection for the preschool child is from the child in the family which is in school. This being true, it is evident that by controlling diphtheria among school children we at the same time con-

trol a large percentage of that among those of preschool age.

If we can secure immunity against diphtheria among 85 per cent of the children, we have the disease practically under control. No further campaign will be waged to immunize the children in the Auburn schools; our whole effort now will be exerted toward immunizing all the children who are entering school for the first time, and as many as possible of the younger children in the family. By this method we expect to maintain this low diphtheria rate which has practically eliminated diphtheria as a serious factor in that city. During the last two months we have secured the consent of parents for the immunization of about 400 children of this age. The immunization of this number was practically completed last week.

There is a tendency at present to omit the preliminary Schick testing of children, only doing this later to test the results of immunization. Among rural school children and children of the English speaking races this is perhaps justifiable, at least up to the age of twelve years. Among the Polish and Italian children I believe that preliminary Schick testing should be done, as our results show that among these races the percentage of natural immunity is very high, which immunity cannot wholly be accounted for by environment and a greater association with the disease. In our experience only 26 to 28 per cent of the Polish children, and 35 to 38 per cent of the Italian children are positive reactors when Schick tested.

It thus becomes evident that it would be a great waste of time and material to give the three doses of toxin-antitoxin to this large percentage of children who are naturally immune.

A striking example of this immunity was shown in two parochial schools in Syracuse. These two schools are in practically the same environment and not more than an eighth of a mile apart. In St. Patrick's school, which is composed entirely of Irish children, the positive reactors on Schick test were 58 per cent, while in the nearby Polish school the percentage was but 27, and this same variation has been shown in all of the schools in which we have had an opportunity to demonstrate this point. In the City of Auburn the positive reactors among the Polish children were 26 per cent, among the Italian children 36 per cent, and among the English speaking races 82 per cent; the general average for all races being 60.5 per cent.

Another question has been raised—"Is the re-Schick test necessary?" I believe it is, for the following reasons: In reading the re-Schick reactions from six months to a year following immunization, we find the majority of positive reactors do not show the same intensity of reaction that they showed in the first test, probably due to partial immunization. There will, however, be a few who will show the stronger reaction, in which case it is our belief the child is entirely without protection and should at once be given another series of toxin-antitoxin.

The only death which has occurred among the children treated in Auburn or among those who have been found negative, was a boy twelve years old, who was Schick tested in the spring of 1922, was positive, was given the three immunization doses of toxin-antitoxin immediately following the test, was retested six months later and was found to be still positive, but to whom we did not give the second series of immunization doses. A few months after this, he contracted what was diagnosed as diphtheria clinically and by the laboratory test. In spite of the fact that he received 30,000 units of diphtheria antitoxin intravenously within thirty-six hours after the onset of the disease, he died five days later from symptoms of general septicemia. There is, of course, a question whether this death was not due to some other throat infection, he being merely a diphtheria carrier, or whether it was due to the failure of his system to develop

immune bodies, either from stimulation by the toxin-antitoxin or from the diphtheria toxin.

We have re-Schicked 2,655 of the 3,329 positive reactors. About 80 per cent of this number showed that they had become immune from the first series of doses of toxin-antitoxin. Three hundred and nineteen of the positive reactors as shown by the re-Schick test were given a second series of toxin-antitoxin immunization doses and 174 of this latter number were given the second re-Schick test when it was found that only 5 were still positive. Of these 5, 3 were given the third series of toxin-antitoxin injections and all were negative on the next re-Schick test.

Of the 6,386 children which includes 85 per cent of the grammar school grades, about 50 per cent of the high school children, and 700 preschool children, there has not been a single serious reaction nor has there been a single case where there was the slightest evidence of infection.

I believe it is therefore safe to assume that in the Schick test and toxin-antitoxin treatment we have a simple and safe method of producing immunity against this dreaded disease, and with persistent effort it is possible to eradicate diphtheria among the children of a city of third class. Among the 50 cases of diphtheria which have occurred in adults in Auburn during the past five years there has resulted but one death; the indications then are quite plain that we should exert our efforts largely upon the kindergarten and preschool children.

From our observation, which includes over 13,000 children treated in other communities in central New York, in addition to those treated in Auburn, immunization apparently begins immediately upon the administration of toxin-antitoxin, and the question has arisen in our minds as to whether in families and in institutions where the diphtheria contacts can be under daily observation it would not be wiser to begin at once the toxin-antitoxin immunization among the contacts instead of the routine antitoxin protective treatment, reserving this latter treatment to be administered in the event of clinical symptoms developing.

A COMMUNITY CHILD HEALTH SURVEY*

PHILIP S. PLATT, C.P.H., Fellow A.P.H.A.,
AND
GEORGE T. PALMER, Dr.P.H., Fellow A.P.H.A
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THE LACK of comprehensive information on the status of child health work, public and private, in many cities induced the American Child Health Association to seek the facts. The information was necessary if the Association was to promote child health in the most effective manner. It was also believed that a real stimulus to self-improvement on the part of communities would inevitably arise from an effective presentation of the facts, especially when opportunity was given to compare the child health activities of one community with those of another.

LIMITATION OF SURVEY TO SMALLER CITIES

The selection of the cities to be surveyed was made easy by reason of the fact that the United States Public Health Service was planning to resurvey the 83 cities studied by the Committee on Municipal Health Department Practice of the American Public Health Association in 1921, extending the field, however, to include all cities over 70,000. It was evident that the study of a group of cities under 70,000 in population would extend our knowledge in that direction in which it was most lacking and most needed. Eighty-six cities were found to be included by the United States Census figures for 1920 in the population group 40,000 to 70,000, scattered through 31 states and comprising a total population in 1923 of some 5,000,000 individuals. In its desire to prevent duplication and to work in the most coöperative relationship with the United States Public Health Service and the American Public Health Association several conferences were held at which means of mutual coöperation were discussed.

PREPARATION OF INFORMATION GATHERING SCHEDULE

The preparation of a schedule for gathering the desired information was undertaken with eyes wide open to the pitfalls of questionnaires, and with due regard to the requirement of eventual tabulation and analysis. The subjective type of question was eliminated, and every query made as categorical and specific as possible. The schedule was based upon that used by the Committee on Municipal Health Department Practice. It was modified and amplified to include all unofficial health activity, and after editing by several national health agencies, it was subjected to a practical trial in 3 cities of marked diversity; again modified; compared minutely with the draft of the schedule under preparation by the United States Public Health Service for the survey of the larger cities and further revised. Finally, three of the five surveyors chosen to carry on the survey considered every item, and agreed on definitions and instructions for using the schedule. And yet, in spite of these painstaking precautions, our field experience with the schedule revealed numerous weaknesses.

CONTENT OF THE SCHEDULE

The schedule actually contained some thousand items, arranged under 84 sep-

* Read at the Joint Session of the Public Health Administraton Section, A.P.H.A., and the Michigan Public Health Association at the Fifty-third Annual Meeting of the American Public Health Association at Detroit, Michigan, October 21, 1924.

arate topics, which in turn were divided among 6 major divisions. These divisions were: *I*, Characteristics of the City—Physical, Governmental, Economic; *II*, Public Health Practices, official and unofficial, with subdivisions on Administration, Vital Statistics, Communicable Disease Control, Maternity, Infant, Preschool and School Hygiene and Food Control; *III*, Education, embracing Popular Education of Public, Health Education of Mothers, and of Children, and Professional Training of Teachers; *IV*, Relief and Rehabilitation; *V*, Recreation; and *VI*, Public Utilities, including water supply, sewage disposal, garbage collection and other special sanitary problems handled by the community. In addition to the above schedule dealing with health activities, a questionnaire was prepared for the purpose of ascertaining health habits of school children.

METHOD OF CONDUCTING SURVEY

The survey was conducted by five men with special training and experience in the field of public health. In the effort to insure a uniform interpretation and use of the schedule, each surveyor was accompanied and instructed on his first survey by the senior surveyor who was chiefly responsible for the preparation of the schedule.

It is a pleasure to record the courteous welcome which the surveyors everywhere received. The hospitality and coöperation of local and state officials, public and private, was cordial and helpful beyond any anticipation. Requests for immediate or eventual service of some type were made in a great many cities, and opportunities for service were noted in practically all of the cities.

A procedure which has added greatly to the value of the survey was the preparation by the surveyors of a descriptive account of geographical, political and economic characteristics of the city, with a résumé of the significant facts regarding the health work, both public and private.

Such, in brief, was the nature of the survey. It was begun January 19, 1924, and finished just five months later. The surveyors then reassembled to discuss and further edit their reports, already tabulated. The analysis and interpretation of the data and writing of the report have been under way several months and the completed report should appear by July, 1925.

THE FINDINGS

In this preliminary report only a score or two of the findings can be presented from the several thousand which will be treated in the final report.

The Infant stands out as the best cared for individual in the community. In 79 of the 86 cities some infant welfare service was maintained, though in only 70 of the 79 were physicians in attendance at the clinics.

The average yearly enrollment of infants was 292. The local department of health conducted the clinic service in 25 of the 80 cities, other agencies in 45.

The Prenatal Child. Far less favored are the prenatal child and the preschool child. Prenatal clinics with physicians were found in 40 cities, half of these being under private supervision. Five cities reported a non-medical prenatal service. In the 29 cities in which the registration of new cases was obtainable the enrollment represented only 8 per cent of the community's prenatal cases. In this connection it is significant to note that midwives are supervised in slightly more than one-third of the cities.

The Preschool Child still plays a very poor second fiddle to his more illustrious younger brother. In most instances he is allowed to tag along to the baby clinic. In 25 cities his claims for a day nursery were ignored, but of the 61 cities with day nurseries 50 had some medical supervision.

The School Child received our special consideration. The work of the school teacher, nurse, and doctor was studied; the sanitary and hygienic conditions of the school buildings were observed, and the

health habits of 35,000 5th grade children in 900 schools were individually secured by means of a questionnaire.

We discovered that teachers are gradually awakening to their opportunity to make health a dominating motive in the lives of their children. School nurses were found in 84 cities, where for the most part the number of children cared for was less than 3,000 per nurse. Medical inspection of school children was almost universal, though it seldom approached its potential possibilities for effective service. It is interesting to note that the medical supervision was under the department of education in 55 cities; under the department of health in 23. While physical education courses were given in 77 cities, with directors in 71, organized courses in health education were found in only 54 cities, with directors of the work in 11.

The schools were found to be reasonably sanitary. Common towels were discovered in only 10 of the 900 schools, though common pencils appeared in 351. Thirteen common drinking cups brought apologies from 13 principals. About one out of 5 schools still needs more handwashing facilities, and one out of 10 more toilets.

While our facts are only as accurate as the truthfulness of the replies, we believe we have reason to attach a considerable degree of accuracy to the written, unsigned statements of the 35,000 5th grade children regarding their health habits of the day on which the questions were asked or the day preceding. While in many respects it appears that the great bulk of our young children are growing up with reasonably good health habits, there is still much room for improvement. We may take some satisfaction in the fact that 91 per cent of the children have a bath at least once a week; that 47 per cent get 10 or more hours of sleep a day; that they play out of doors on 6 out of 7 school days; that they brush their teeth on 5 out of 7 days, and practically all have a substantial breakfast. On the other hand it is a serious matter that according to the replies of these children 29 per cent are unvaccinated against smallpox; that half had not visited a dentist during the past year; and that 38 per cent drink one or more cups of coffee a day, and 20 per cent drink no milk. While 4 out of 5 of the children drank some milk, only 3 out of 5 drank a pint or more daily, and 1 out of 5 drank a quart or more. The average was 1.4 glasses a day.

Such, with extreme conciseness, is our first hand glimpse of American childhood, with its health promoting assets and liabilities. After all, one would not be afraid to enter our average American child in a Health Olympics.

THE DEPARTMENT OF HEALTH

Effective child health work cannot stand alone. It is indissolubly bound up with all other phases of public health work. We may therefore mention ever so briefly a few facts about the official health machinery of these communities. The appointment of a health officer marks the beginning at least of official attention to health matters. It is a source of some satisfaction to report that each of the 86 cities possesses a health officer. One-half of these are devoting full time to their work. Boards of health exist in 68 cities; in the other 18 the city commissioners or council act as a board, on occasions. The personnel of the health departments varies widely, one city having 29, several only 3. Inspectors vary from 1 to 16, and nurses from none to 12. Expenditures range from 8 cents to 94 cents per capita.

THE CONTROL OF COMMUNICABLE DISEASE

Tuberculosis. The reporting of communicable disease is far from perfect. For example, in 17 cities the records actually show more deaths from tuberculosis than people sick with the disease. There is an average of 1.6 cases reported for every death. In 71 of the 86 cities some specific provision was made for the diagnosis of tuberculosis, but only 21 clinics were supported by the department

of health alone. The new cases registered per year averaged 107, with half of the cities reporting less than 69 new cases.

Venereal Disease Clinics. Venereal disease clinics were found in 65 cities. They were supported by the health department alone in 22 instances, by the state alone in 16 cases, and in the remaining 27 cities various combinations of private, city, state and federal support were found. The figures secured from records in 44 cities showed an average annual clinic attendance of 2,400 visits.

Smallpox. If the proportion of unvaccinated children indicated by the 35,000 5th grade replies holds good for the country at large we have some 32,000,000 people in this country who are a ready prey to the most easily preventable of diseases. To leaven this mass we have reports from 41 cities that secured a total of 134,429 vaccinations last year, with 18 cities reporting less than 1,000, and New Britain, Conn., reporting 36,000. Vaccination is a compulsory requirement for admission to school (obviously not always enforced) in 48 cities.

Diphtheria. Approximately 550 people, mostly children, died from diphtheria in these 86 cities last year. It is estimated that there were 6,600 cases of the disease; yet only 40 cities reported immunizations with toxin-antitoxin, totaling 43,351 in number.

PASTEURIZATION OF MILK

Although 16 outbreaks of communicable disease have been directly traceable to the milk supply in this group of cities in the past 5 years, the pasteurization of the milk supply is still apparently a matter of considerable indifference to many of these communities. Twenty-one cities pasteurize 90 per cent or more, 28 cities pasteurize from 50 to 90 per cent, and 30 cities less than half of the milk supply. For 7 cities no record was obtainable.

PUBLIC HEALTH AND GENERALIZED NURSES

The public health nurse is a recognized institution. All 86 communities look to her, either through public or private agencies, for advice and care. In a little less than one-half of the cities there was more than one nurse to each 10,000 of population.

RECORD KEEPING

Out of the thousands of items collected in such a survey a few score are given. But quite as significant as these positive and negative findings is the state of affairs revealed by the lack of definite information, the absence of records, and the inability and sometimes disinclination to secure adequate indications that an activity is being effectively carried on. The ever-repeated symbol in our schedules is—N.R.—no record. This fact is unquestionably a discredit to our health work. Efficient business is not conducted in this way. Many health officers appear to be in crying need of practical guidance as to how to keep an intelligent and useful record of their work. Does it not behoove the American Public Health Association to provide such assistance by preparing practicable record and report forms, covering the entire bookkeeping of the health department?

COST OF HEALTH WORK

We have deliberately refrained from making a careful study of the cost of community health work. While rough total budgets could be secured without much difficulty, accurate detailed cost data, suitable for comparative purposes, could not be obtained without exhaustive study, such as was impossible in a brief survey. It would constitute a study in itself and its importance would doubtless warrant such an effort.

CONCLUSION

Even at this stage of its analysis, it is possible to draw some impression of the status of community health activities in these cities.

1. Somewhere, in every city, though not always in the health department, there may be found an appreciation of the wonderful possibilities of modern child health

and of public health work, accompanied by an earnest desire to arouse the community to a sense of responsibility for attaining the attainable.

2. It has been very evident that cities are wasting money by not securing technically trained personnel for the technical job, whether it be in the field of child welfare or elsewhere.

3. While the health officer is the recognized leader of the health forces of his community, his greatest sources of strength frequently lie in the unofficial agencies, or in city departments with which his working relations are undeveloped, and we believe he could profit immediately and greatly by improving these relations.

4. So great is the interdependence of child health and the entire health movement that success in one depends upon success in the other. Yet the great diversity in effectiveness, methods and emphasis in health work suggests that growth has been haphazard and without guidance rather than based upon definite goals, with standardized methods, and balanced programs. Is not the time ripe for the American Public Health Association to take the initiative in establishing the standards whereby health officers may more clearly distinguish between efficient and inefficient work; in preparing for those health administrators who would desire such assistance practicable guides for conducting certain health activities; and in making available a balanced plan for the development of a complete community health program?

In conclusion, we desire to express our sincere thanks to the many official and private individuals in the cities visited for the cordial reception given our surveyors and for the aid in making these findings of practical value.

This survey is already becoming productive and efforts are now under way for making these findings of real account.

Child Health Demonstrations.—Dr. Walter H. Brown, director of the Child Health Demonstration at Mansfield, Ohio, has been appointed director of the demonstration to be opened at Marion County, Oregon, the early part of 1925, according to an announcement made by the Child Health Demonstration Committee representing the American Child Health Association and the Commonwealth Fund of New York City. Dr. Brown left for Oregon January 1.

Dr. William DeKleine, health officer at Saginaw, Michigan, has been appointed to succeed Dr. Brown at Mansfield.

Dr. Brown has had long experience in public health work. He is a graduate of Jefferson Medical College, and took post-graduate work at the Harvard-Technology School for Public Health Officers. Among his many activities are, epidemiologist for the Massachusetts State Department of Health, health officer at Bridgeport, Conn., Associate Director of Health Service for the American Red Cross at headquarters in Washington, affiliation with the Commission for the Prevention of Tuberculosis in France under the Rockefeller Foundation. Dr. Brown returned to the United States in 1921 to become director of the Child Health Demonstration at Mansfield, Ohio.

Dr. DeKleine goes to the Mansfield demonstration highly recommended for his achievements in the public health field, and especially for his pioneering in Michigan. He organized an excellent health department in Saginaw where he was appointed the first full-time health officer in 1922. Previous to going to Saginaw, Dr. DeKleine served at Flint from 1917 to 1922. He is a graduate of Hope College and the Northwestern University Medical School, and took a post-graduate course in public health at the University of Michigan. From 1915 to 1917 Dr. DeKleine was director of the Michigan Tuberculosis Survey conducted under the State Board of Health; for several years he served as president of the Michigan Tuberculosis Association; he was a member of the Board of Directors of the National Tuberculosis Association, president of the Michigan Public Health Association, and chairman of the public health section of the Michigan State Medical Society. Last year Dr. DeKleine was awarded one of the physician's scholarships offered by the American Child Health Association, and took a course at Massachusetts Institute of Technology.

DENTAL HYGIENE FOR THE CHILD*

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THE CONDITION of the teeth and mouth has an important relation to the physical well-being of the child. Dental caries is the most prevalent of all human diseases, and it is largely a disease of youth. If an individual can be brought up into the twenties free from dental decay the incidence of caries is greatly lessened after that unless some ulterior factor which results in a profound impression on the resistance upsets the balance, such as a prolonged and depleting illness, or a period of severe mental stress.

The importance of dental hygiene for the child therefore becomes a matter demanding our most earnest consideration, and this subject should have a place on every health program. There are so many significant things having a direct bearing on mouth hygiene that it will be necessary to merely touch on a few in the most incidental way at this time. With this, as with all other health matters, the question most to the fore is that of prevention. To be able to prevent even in a limited sense a disease which is more widespread than any other in the human family is a profound desideratum.

We have so far merely touched the fringe of the problem; but we have learned something of what the problem is, and we are beginning to find how best it may be approached. If dental caries is ever to be prevented it must be done by the people themselves, rather than by the physician or dentist. The function of the professional man is to so educate the people that they may know what to do, and in the light of our past experience this may be considered only the half-way house to a solution of the situation. It is one thing to teach people what to do—it is an altogether different matter to induce them to do it.

It must be instilled into every individual that in the matter of prevention the daily care of the teeth and mouth by the patient is of greater moment than the occasional care of the dentist. Of course, there are certain things which the dentist can do and which the patient cannot do in the way of cleaning the teeth when deposits have once gained a foothold. The moment decay has actually started the patient is almost wholly helpless without the services of the dentist. But the daily hygiene of the mouth must be insisted on in every susceptible case if good results are to be obtained. But the greatest difficulty is that few of us do that which is best for our individual welfare, even when we know what is best.

Take, for example, the matter of diet—a subject that is claiming much attention as it relates to the prevention of dental caries. Supposing it were possible to formulate a diet which was a known inhibitor of caries, how many, even among dentists themselves, could be found who would religiously adhere to this diet? For the good reputation of my profession I should hesitate to put the matter to a test.

It has been claimed that to make a physically efficient individual it would be necessary to begin with the ancestors, that at least one important factor would be the grandparents; but so far as I have been able to observe, in conserving the health of the children of today we have really very little influence with their grandparents. We must take them as we

* Read before the Child Hygiene Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 21, 1924.

find them and do the best we can with the material at our command. And it is not such an altogether hopeless task as we might suppose.

While heredity may have a decided bearing on the situation, yet the most significant thing connected with the tendency to dental decay is the environment of the teeth rather than their structure—in other words, the conditions which surround the teeth are more of a deciding factor than the character of the tooth structure itself. This is fortunate, because we can more easily change the conditions than we can change the teeth, which organs are the most stable tissues of the human body, and the least subject to internal influence. A tooth once formed in the mouth remains practically the same so far as the percentage of organic and inorganic material is concerned through life unless attacked by outside agencies.

The thing for us to do then in private practice and in community clinics is to constantly educate the children along oral hygiene lines; to put the matter squarely up to them that if they are to preserve their dental health the initiative must come from them; that they must give particular attention to the teeth during childhood, and for their own protection they must have their teeth examined frequently to detect deleterious deposits or small cavities and have them attended to before they become dangerous.

A clinical fact worth recording is this—that with care on the part of the patient and proper supervision by the dentist the tendency to decay may largely be minimized in most mouths, and in all mouths the period of immunity may be advanced far beyond the usual age. In other words, there are numberless cases on record where with proper care, the teeth of children have been kept in excellent condition, and the susceptibility largely overcome at a period in life when both parents had lost many of their teeth. If this sort of campaign is kept up for several generations we may confidently expect a much better condition of the teeth of the human family, and this phase of our service is strongly commended to our practitioners.

One of the things to teach is the importance of preserving the deciduous teeth till nature is through with them and ready to cast them off. They were placed there for a definite purpose, and this purpose should not be defeated by their early loss. To state their real function would require too much space, but there is one subject that must always be emphasized when children's teeth are under consideration. That is, the question of the first permanent molar, which is really the most important tooth in the mouth. Every physician, nurse, welfare worker, governess, and mother should be informed on the significance and function of the first permanent molar. No mouth is ever perfectly normal when this tooth is lost, and yet through the peculiar circumstances attending its eruption it is more frequently neglected and more prone to decay than any other permanent tooth. It is among the first of the permanent set to appear, and coming in as it does, immediately posterior to the deciduous teeth, and without any disturbance during its eruption, it is almost invariably mistaken for a deciduous tooth, and permitted to decay on the theory that it is soon to be shed and is not worth saving. How many mouths have been nearly wrecked by this erroneous idea can never be estimated.

Aside from the fact that it is one of the most effective masticating teeth in the mouth, it has a special function which is never realized by the laity and not always by the profession. It is the real standard-bearer of the dental arches during the developmental period when the deciduous teeth are being lost and the permanent teeth are taking their places. It is the one tooth to hold the jaws the proper distance apart while the child is erupting the permanent teeth, and if this tooth is lost early in life it invariably causes a dropping together of the two

jaws, resulting in a serious impairment of the contour and character of the face.

Every one who has anything to do with the rearing of children should watch for this tooth, which comes in at about six or seven years of age, and if the slightest cavity appears it should be filled at once, and the tooth preserved at no matter what sacrifice of time and energy.

There is one feature of dental hygiene for the child that is frequently overlooked, and that is the economic factor. This directly affects the public funds—particularly school funds. Many of the failures among children to make their grades in school are due to physical handicaps, and the cost of teaching these "repeaters" has become a matter for serious consideration among our civic authorities. In the City of New York the Board of Education has estimated this cost at more than $1,000,000 annually, and they are on record as stating two significant things in this connection: that 80 per cent of the failures are due to physical handicaps, and that most of these are connected with the mouth and teeth. If one-half of this sum were expended in preventing these diseases, it would not only contribute largely to the avoidance of suffering among the children, but it would tend to stop so much wastefulness at its source.

Another thing that has a direct bearing on early and intelligent service to the child is the correction of dental deformities. Irregularities of the teeth are apparently becoming more prevalent, and there are two considerations connected with irregularity which should claim particular attention—the impairment of function through inadequate mastication due to faulty occlusion, and the serious handicap to any child whose face is deformed by irregular teeth.

Society demands so much today that no child should be permitted to grow up with a physical handicap which modern science can correct. There are too many concrete examples of children who have failed through this medium to achieve the success to which they were entitled by their native ability, to permit us longer to look upon these things as a trifling matter. Every child is entitled to a fair chance to make his way among his fellows without the limitations which accompany a conspicuous and unsightly deformity.

This whole question of dental hygiene for the child resolves itself into recognition of its need, and to an early and intelligent care of the teeth and mouth to the end that many of the dental troubles of childhood are checked at their source, and much suffering is saved. To accomplish this there must be, from every conceivable agency, a campaign of education carried on till the gospel of prevention is brought to the consciousness of every one having to do with the rearing of children.

DISCUSSION BY WILLIAM A. GIFFEN, D.D.S.—It is a great pleasure to be able to take part in the dental health program of the American Public Health Association, as a representative of the American Dental Association, which is composed of a membership of over 35,000 dentists.

The Michigan State Dental Society, which is a component of the American Dental Association, has done considerable work in the interest of oral hygiene, one important step being the organization of a Dental Health Committee whose function is to promote the active support of the dental profession of this state, for better health conditions.

The committee has coöperated with our State Health Commissioner, Dr. Olin, who has assured us of his appreciation of our assistance in his administration of Michigan health problems. Our Governor, Hon. Alex. J. Groesbeck, is also willing and anxious to assist in the passage of any sane measures to protect and make better health conditions in Michigan. There is a wide field for such activities, and there is great need for this work in almost every district of every state.

Of course, in order to obtain the coöperation of Governor Groesbeck, it will be necessary to strip all legislative matters of fads or notions of impractical idealists.

Dr. Johnson has just given us a résumé of a story, the first chapter of which appeared about 3000 B.C. in Egyptian literature. It was

then that the first reference to the dental problem was made by an author who suggested that, if people were to make a paste of one-quarter part of the ashes of the head of a hare, one-quarter part flint stones and one-half part honey, and were to rub this on their teeth frequently, they would help preserve the teeth. From that time to the present day, the health of the mouth has been a problem, varying in degree through the centuries and among different nationalities.

At first the health of the oral cavity was considered a problem *per se*, quite apart from the rest of the body and of concern to the individual only. But, as the relationship between the health of the oral cavity and the general health of the individual has come to be more clearly understood, mouth hygiene has become a public health problem, with physical, mental, moral and economic aspects—a problem to be solved by your group and the dental profession.

The problem naturally resolves itself into two parts, the reparative and the educational.

With the realization that dental caries is primarily a disease of childhood, and that the school physicians and school nurses find it by far the most prevalent of all physical defects, the question arises, "What shall be done?" The lay person wants to establish a dental clinic immediately in order to fill the cavities. Such a thought is founded on altruism rather than on practicability or sound public health administration. I do not mean to speak disparagingly of dental clinics for school children, for we recognized their need years ago here in Detroit, and they have proved to be of inestimable value. What I do mean is that filling a cavity is palliative treatment unless one understands and practices the fundamentals of preventive dentistry.

Education is the basis on which any dental health program should be developed. This education, from a community point of view, should begin in the prenatal clinics and should extend through the school life of the child. As soon as we can make communities see the value of beginning reparative work for indigent children with the preschool child, we will come nearer to solving the problem.

To aid in educational work, the American Dental Association has recently established a department of Dental Health Education, which purposes to supply educational material and information on dental health service. The department has already sent letters to the commissioner of public health and the commissioner of education in every state, in hope that, through them, school physicians, school nurses, school teachers and others interested in and working for the health of the child and of the community may be reached with the announcement of our service.

Four state departments of public health are already distributing the pamphlets on "How to Build Sound Teeth" and "Children's Teeth: How to Use and Keep Them," which were written and copyrighted by the American Academy of Periodontology and are distributed by us. We have recently given these states permission to make their own reprints of these bulletins, since it will be more economical for them, and any other state department of health will be given a similar permit by application to the department. The department also has motion pictures, slides, posters, songs, rhymes and stories to offer. In the October issue of the *Journal of the American Dental Association*, a copy of which I have here, a complete announcement of material is made, and from time to time notices of additional material will appear.

The section on dental health education in the *Journal* aims to keep in touch with dental activities throughout the country. I propose to make a plea in my message to our members at our annual meeting which convenes at Dallas, Texas, November 10, that our members become affiliated with the American Public Health Association, in order that matters pertaining to dental health in this country may represent the best efforts of the dental profession as well as the medical profession. I cordially invite you to get acquainted with our central office. By an exchange of ideas, we may be able to determine what the exact relationship of a community dental health program to a community general health program should be.

VIRGINIA'S ATTEMPT TO ADJUST THE COLOR PROBLEM*

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THE SETTLERS of North America came not as did the Spanish and Portuguese adventurers of the southern continent, without their women, bent only on conquest and the gaining of wealth and power; but bringing their families, the Bible, and high ideals of religious and civic freedom.

They came to make homes, to create a nation, and to found a civilization of the highest type; not to mix their blood with the savages of the land; not to originate a mongrel population combining the worst traits of both conquerors and conquered.

All was well until that fateful day in 1619 when a Dutch trader landed twenty negroes and sold them to the settlers, who hoped by means of slave labor to clear the land and develop the colony more quickly.

Few paused to consider the enormity of the mistake until it was too late. From this small beginning developed the great slave traffic which continued until 1808, when the importation of slaves into America was stopped. But there were already enough negroes in the land to constitute them the great American problem. Two races as materially divergent as the white and the negro, in morals, mental powers, and cultural fitness, cannot live in close contact without injury to the higher, amounting in many cases to absolute ruin. The lower never has been and never can be raised to the level of the higher.

This statement is not an opinion based on sentiment or prejudice, but is an unquestionable scientific fact. Recently published ethnological studies of history lead to this conclusion, as do the psychologic tests of negro and negroid groups, especially the tests made by the United States Army for selective service in the World War. It is evident that in the hybrid mixture the traits of the more primitive will dominate those of the more specialized or civilized race. It is equally obvious that these culturally destructive characteristics are hereditary, carried in the germ plasm, and hence they cannot be influenced by environmental factors such as improved economic, social and educational opportunities. On the contrary, such opportunities often accelerate the inevitable decadence. Dr. A. H. Estabrook in a recent study, made for the Carnegie Foundation, of a mixed group in Virginia many of whom are so slightly negroid as to be able to pass for white, says, " School studies and observations of some adults indicate the group as a whole to be of poor mentality, much below the average, probably D or D– on the basis of the army intelligence tests. There is an early adolescence with low moral code, high incidence of licentiousness and 21 per cent of illegitimacy in the group."

When two races live together there is but one possible outcome, and that is the amalgamation of the races. The result of this will be the elimination of the higher type, the one on which progress depends. In the mixture the lower race loses its native good qualities which may be utilized and developed in the presence of a dominant race.

* Read at the joint session of the Public Health Administration and Vital Statistics Sections of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 23, 1924.

The mongrels are superior in mental power to the lower race. They are more cunning and more capable, but they lack the creative power of the higher race, and cannot sustain a lasting civilization that will rank with the best of the world.

History affords many examples. Egypt in the day of her greatness was white. But the white Pharaohs began to extend their dominion south into the negro land, and to bring back multitudes of captives for laborers and soldiers, special mention being made also in their records that women in large numbers were included. Interbreeding with these negroes began and continued through many centuries until the country became largely negroid.

The climax was finally reached when one of the Pharaohs took to himself a negro wife and his mulatto son Taharka succeeding to the throne. The color line had vanished and with it Egypt's greatness. Assyrian invaders met with no effective resistance. From that day to this Egypt has been a mongrel nation, incapable of initiative, and now dependent upon foreign protection and leadership.

India affords a parallel example. Four thousand years ago the invasion of India by Aryans occurred. These came into contact with a mixed population of white-yellow-black composition. The conquerors attempted to prevent their own amalgamation with the natives by establishing a rigorous caste system, which was not like the present one based upon occupation, but upon color. This system failed, and though caste is still in force in India the reason for it no longer exists.

Modern South Africa is a melancholy example of what may occur when the intermixture which inevitably results is hastened by fanatical religious teaching and misguided legal interference from the mother country. Major E. S. Cox, who spent years in that region and in other countries studying race conditions, in his book "White America," * gives a graphic account of the struggle made by the determined colonists against the imposition. They lost out, and the population of Cape Colony province is today largely mixed, showing how quickly this condition results when the natural process is speeded up by negrophilism and the law.

Let us return now to our own country, and, as we are considering Virginia, to that state in particular.

There are about twelve million negroes of various degrees of admixture in the Union today. Of the population of Virginia, nearly one-third is classed as negro, but many of these people are negroid, some being near-white, some having actually succeeded in getting across into the white class.

The mixed negroes are nearly all the result of illegitimate intercourse. The well known moral laxity resulting from close contact of a civilized with a primitive race makes illegitimate intermixture an easy matter. This is illustrated by the fact that the illegitimate birth-rate of Virginia negroes is thirty-two times that of Rhode Island, while the District of Columbia rate is thirty-seven times, and that of Maryland forty-six times.

In the days when slavery was still a blight upon our state, it was quite a common occurrence for white men to father children born to the negro servants. The history, as related to me, of at least one colony of people known as "Issue" or "Free Issue," now spread over several counties, is that they originated in part in that manner.

It was considered undesirable to retain these mulattoes on the place, bearing the family name, and a number from one county were given their freedom and colonized in a distant county. These intermarried amongst themselves and with some people of Indian-negro-white descent, and received an additional infusion of white blood, either illegitimately or by actual marriage with low-grade whites.

At present these people are claiming to be white, or Indian, and under the former law when a person with one-sixteenth negro blood could be declared white, they

* White America Society, Richmond, Va.

were able in some instances to establish their claim legally.

These mixed breeds are not classed as white by the people of the community, and they will not associate with the genuine negroes. Five hundred or more in number they thus constitute a class of their own, and a serious problem in that county and others to which they migrate. If refused classification as white they claim to be Indian, and as such have been accepted in the birth reports to avoid listing them as white.

In a recent test case, the court upon evidence submitted from our birth records reaching back to 1853, and from the testimony of old residents, decided that these people under the new "Racial Integrity" law cannot be permitted to intermarry with whites.

Another large colony which extends over into North Carolina probably has a similar origin. We have also compromised with these, and accept certificates as Indians, which indicates to us that they are not white.

In another county are about forty descendants of an illegitimate mating of a negro man and white woman four generations back. All of these have formerly succeeded in being classed as white, though under the new law our office has supplied to the clerks who issue marriage licenses, school authorities, commonwealth's attorneys, physicians and local registrars, a complete family tree, with the injunction to class them as colored.

Similar conditions exist in other localities, though not yet so far advanced. A case was recently discovered where a white man married a mulatto woman (probably in another state), and now has nine children, four of them being reported to our office as white. Investigation revealed the fact that two other women bearing the same family name had mated with white men and were raising large families of children.

Another man whose birth was reported in 1878, both parents being registered as colored, had the court declare him a white man under the one-sixteenth law; married a white woman, and has four children reported as white by physicians.

The question of their color was referred to our office by the school authorities when the facts were discovered, and the white school advised under the new law not to receive them, though they engaged a lawyer to assist them.

These examples illustrate the fact that even in Virginia where the questions of race and birth receive as much attention as anywhere in the country, the process of amalgamation is nevertheless going on, and in some localities is well advanced. Complete ruin can probably be held off for several centuries longer, but we have no reason to hope that we shall prove the one and only example in the history of the world of two races living together without amalgamation.

In Mexico, much of South America and the West Indies the process is practically complete, the mixture being Spanish or Portuguese, Indian and negro. Some portions of southern Europe have undergone a similar admixture. Immigrants from these lands to this country, while really negroid, are classed as white.

Several South American countries, or portions of them, still retain a considerable degree of race purity, which is being maintained by European immigration.

The immigration law recently passed by our Congress will stop the legal admission of Mongolians and will check much of the negroid immigration from elsewhere in the old world, but it will not prevent negro and negroid immigration from other parts of the western hemisphere. It is estimated that there are today from 500,000 to 750,000 Mexicans in the state of Texas alone, and that Mexicans compose more than half of the population of Arizona.

We come now to the question of a solution of the problem.

There is but one absolute solution which is acceptable and feasible, and that the one advocated by Lincoln and other far seeing statesmen of the past—the

separation of the races by gradual repatriation of the colored races. This measure is still possible, but the longer it is deferred the greater the task.

In the lifetime of some now living we may expect the present twelve million colored population to increase to twenty or possibly thirty millions, and that perhaps to one hundred millions during the next century, to say nothing of the prolific Mongolians who are already firmly established upon our western coast. With the competition of this large number of people of low ideals and low standards of living, and the great effort to secure the means of maintaining a family up to the desired standard, the white population will to that extent be crowded out.

Virginia has made the first serious attempt to stay or postpone the evil day when this is no longer a white man's country. Her recently enacted law "for the preservation of racial integrity" is, in the words of Major E. S. Cox, "the most perfect expression of the white ideal, and the most important eugenical effort that has been made during the past 4,000 years." Of course this law will not prevent the illegitimate mixture of the races, although a law requiring the father to share with the mother the responsibility of the birth would have a deterring effect. When more than one man is involved, all should be held equally responsible in sharing the cost, as I am informed is the case in Norway.

But it is possible to stop the legal intermixture, and that Virginia has attempted to do in the above mentioned law, which defines a white person as one with "no trace whatsoever of blood other than Caucasian," and makes it a felony punishable by confinement for one year in the penitentiary to make a willfully false statement as to color.

Clerks are not permitted to grant licenses for white persons to marry those with any trace of colored blood. It is needless to call attention to the sad plight of a white person who is thus imposed upon or of a white woman who under such circumstances would give birth to a child of marked negro characteristics, as will occur from time to time under Mendel's law.

The new law places upon the office of the Bureau of Vital Statistics much additional work, but we believe it will be a strong factor in preventing the intermarriage of the races and in preventing persons of negro descent from passing themselves off as white.

We are greatly encouraged by the interest and coöperation of physicians, local registrars, clerks, school authorities, the general public, and even the midwives. Our success during the first four months of the enforcement of this law, in securing more accurate statements as to color on our birth certificates and in correcting previously existing errors is far beyond our expectation.

The states which now permit free intermarriage of the races, as listed in "American Marriage Laws,"[1] are: Connecticut, District of Columbia, Illinois, Iowa, Kansas, Maine, Michigan, Massachusetts, Minnesota, New Hampshire, New Jersey, New Mexico, New York, Ohio, Rhode Island, Pennsylvania, Vermont, Washington, Wisconsin and Wyoming. The most urgent need is the speedy adoption by these states and the District of Columbia of a law forbidding the intermarriage of the white and colored races.

We are all interested in reducing the death rate from preventable diseases, and of increasing our birth rates. Is that, however, the only thought that may occupy the mind of health workers? Is it not of greater importance to the welfare of the state to give some thought to the quality and value of its future citizens, than to lavish all of its energies and money upon prolonging the lives and increasing the number of the unfit, who are already increasing far more rapidly in proportion than the more desirable?

The white race in this land is the foundation upon which rests its civilization, and is responsible for the leading position which we occupy amongst the nations of

the world. Is it not therefore just and right that this race decide for itself what its composition shall be, and attempt, as Virginia has, to maintain its purity?

This is working no hardship and no injustice upon the other races; for the same effort tends at the same time to maintain the purity of their races as well.

That the mongrel races are liable to perpetuate the undesirable qualities of both their constituent stocks is abundantly demonstrated by a study of the larger and older of the mongrel groups in Virginia, as well as upon a study on a far larger scale in various other parts of the world.

The colored races therefore should be equally zealous in preventing both the legal and illegal admixture of the races. We are glad to say that the true negro of Virginia is beginning to appreciate this point and is agreeing to the wisdom of this movement. Our chief trouble is with some of the near-whites who desire to change from the colored to the white class.

By firm adherence to the standard which has been set, we believe that it is possible within a reasonable time to secure through our office an adjustment of the larger number of racial differences, and by constantly securing correction of our vital statistic records, and by stopping all further legal and much of the illegitimate intermixture, at least to hold the situation in check until Lincoln's real remedy can be adopted.

This, however, is but the beginning, and our efforts will be of less avail until every state in the Union joins in the move to secure the best marriage laws possible, and a wholesome public sentiment on this the most important of all questions confronting us as a nation.

Four hundred years ago there were nations whose ships sailed the waters of the world and whose armies and navies made England tremble with fear. They claimed continents as their own, they grew rich upon their vast trade in slaves, selling thousands of them in a day from one block.

These slaves have disappeared, not by transportation, but by assimilation. To-day families of the old type are rare, and these peoples are scarcely thought of in the councils of nations.

Today the eyes of the world are turned with envy upon us, and millions crave the privilege of landing upon our shores.

We are now engaged in a struggle more titanic, and of far greater importance than that with the Central Powers from which we have recently emerged.

Many scarcely know that the struggle which means the life or death of our civilization is now in progress, and are giving it no thought.

What odds will it make in the year 2500 or 3000 to the few Caucasic remnants of our present day Americans, when they look around upon the half billion or perhaps more brown skinned descendants of the races now occupying our land, whether the typhoid death rate of 1924 was one, or one hundred, per 100,000?

What they find in that day will depend upon how we of today think and act. The very existence of our race in that time is dependent upon the thought and action of us today. Let us then accept our responsibility and meet its demands with wisdom and courage.

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[1] American Marriage Laws, Russell Sage Foundation, New York, N. Y., 1919.

VALUES IN THE MAINTENANCE OF HEALTH OF THE WORKER*

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THE UNITS of measurement and the results so far attained in the maintenance of the health of the working class may be outlined under fourteen heads.

OCCUPATIONAL DISEASES

The outstanding features of industrial ill health are occupational diseases and these are reportable in something less than half of the states. In only eight states are some of these specific occupational diseases compensated, although New Jersey may soon be added to this list. Compensation for accidents obtains in one form or another in practically all states. Compensation is a potent factor in prevention, and where fully compensated, an occupational disease soon decreases in prevalence as is well illustrated in Ohio in the case of lead poisoning. This affliction which, a few years ago, recorded hundreds of cases in the aggregate each year has now fallen from first place to second in occupational disease reports. The remarkable thing is that in some twelve establishments, which formerly produced practically all of the reported cases and which are under the provisions of the so-called standard "Lead Law" adopted in Ohio in 1913, lead poisoning has practically disappeared. It is rare now to receive in our state offices a case report of lead poisoning from these plants and we are convinced, after investigating the improved methods of preventing lead poisoning, that such cases seldom occur and those which do are invariably mild in form.

We believe this shows the effectiveness of several factors: education, the adoption of sanitary measures, the reporting law, and the compensation law.

GENERAL ILL-HEALTH

Sickness disability in industry may be said to be decreasing somewhat in parallel with the general decline of sickness; more so in some larger establishments; less so in others, and particularly in the smaller ones. However, our best statistics show that the average worker still loses from 6.5 to 10 days per year on account of disability, of which approximately six-sevenths is due to sickness and one-seventh to accidental injury. Analysis shows that with the knowledge at hand perhaps half of this sickness could be prevented.

Dublin finds that the tuberculosis decline is being blocked more by industry than any other community factor. He also finds that the rate of tuberculosis deaths in an industrial community is an index of its general mortality rate, except in such a state as Colorado, and that the most fertile field for the anti-tuberculosis movement in certain sections of the country is among urban wage earners.

It is well known that the outstanding chronic disease of industrial workers is tuberculosis. This was true in the Census Bureau's report on the "Mortality of Occupations" in 1909. In fact, tuberculosis was the leading cause of death in 110 of the 140 occupations listed for males, and 27 of the 35 occupations for females. These proportions probably do not run so high today but we must accept

* Read at the General Session of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 22, 1924.

the tuberculosis record as one of the chief measurements of industrial ill health.

The chief acute illnesses of workers, according to Emons and also Quinby, are colds, digestive disturbances, and nervous afflictions. Much of this situation is believed to be due to the failure to get to these workers and their employers the best knowledge upon the prevention of these afflictions. The failure seems to lie in the lack of education of public health workers to this fact.

STATE LAWS AND REGULATIONS

The existence of laws concerning work place sanitation and hygiene must also be accepted as a unit of measurement of progress. State legislation governing what we may declare to be industrial hygiene exists in only 34 of the 53 states and territories (1920). The federal government has also produced one outstanding piece of legislation along this line—the abolition of phosphorus poisoning in the match industry (1912) by confiscatory tax. The pending legislation regarding child labor will probably be the next federal measure in this category.

The great variation in the content of these state laws and regulations is at once apparent to any one who investigates. It is surprising to find also that certain less important industrial states have better laws and regulations than some older and larger industrial states. I speak particularly of Missouri in the former connection. Some states, believing they are essentially agricultural and without hazards, have no industrial laws, though there exist in these states extensive mining, lumbering and quarrying industries. In fact, in some northwestern and western states, it was found, in a personal inquiry, that one of the chief bases for the I.W.W. agitation was the intolerable camp and working conditions in these industries.

The lack of appropriations for enforcement of laws is lamentable, but is no more so than the type of unqualified individuals who are so universally filling the jobs of deputy factory inspectors over the country. These are invariably lay persons of political appointment with low salaries, instead of sanitary engineers, industrial physicians, chemists, and others trained for their jobs.

Still, these existing laws may be considered as having an educational value and where compensation practice is in vogue they are undoubtedly better enforced, sometimes even extended with special codes for procedure.

This whole situation is in strong contrast to legislative measures adopted abroad and in existence for a generation or so. Report comes recently that an Australian industrial court has ruled upon the amount of lead which must not be exceeded in 10 cubic meters of breathing atmosphere in the case of the printing trade. There are instances, however, where I believe prohibitive legislation has been detrimental, such as that abolishing all use of lead in paint as advocated by the International Labor Organization at Geneva. It would appear to me to be a step backward to prohibit anything for which an equally good substitute has not yet been found, which is the controversial point in the lead regulation. Regulation should always be the criterion rather than prohibition.

RESEARCH AND STATISTICAL KNOWLEDGE

It may be safely said that safe standards have been discovered and proved for most of the industrial health hazards coming under the head of ventilation, illumination, handling of poisons, prevention of chronic infections, fatigue control through work and recreation adjustments. In fact our research in this field of health work is probably further in advance of its application than in any other. I would not, of course, advocate a slackening up of research, but the advancement of practical application of what is already known.

A certain amount of flaunting of doubtful procedures mostly commercial in aspect also exists, for example ozone treatments of the atmosphere or com-

pounds sprayed around to absorb carbon monoxide from the air.

McCord, in a paper presented at this meeting, is calling attention to the fact that small shops or establishments (employing less than 500) constitute 99 per cent of all work places, and that 60 per cent of all workers are employed in these plants which are the last, as a rule, to profit by the advancement of knowledge. These percentages mean vast numbers of industrial workers when we consider that the last census (1920) shows a total of 41,614,248 engaged in industry in the United States.

WORK OF THE SANITARIAN

The activity of trained or professional health workers is very limited in the field of industrial hygiene. Perhaps this is due to our inability to define the problem to health workers. I think the reason, however, is more an historical one. In the industrial revolution, complaints came at first from labor organizations directly to legislatures who in most instances set up factory inspection bureaus as an extension of the existing labor boards, before health departments were organized or recognized as having any other functions than the prevention of epidemic diseases. It is no wonder, therefore, that this field has been usurped, in the light of science, by an inadequate supervision, political in character, whose foundation preceded the modern scientific era. There are, for instance, perhaps a dozen physicians in the various states officially concerned with workers' health and industrial hygiene, and scarcely more than that number of sanitary engineers, while industrial chemists and other technicians are a prize find. I do not mean to imply that labor departments should be shorn of these functions, but that health should always be in charge of sanitarians.

Thus this field has remained at a standstill for the greater part of two generations. My inquiries show that many state health and labor department officials claim that no interest is shown in this direction. With the status as it is we wonder how it could be otherwise.

The situation is quite different indeed from that which exists in Great Britain, Continental Europe and Australia, where highly trained personnel, busy in devising and extending methods, is to be found and whose achievements are evidenced in scientific and economic circles and in the literature.

INDUSTRY'S OWN ENDEAVORS

Noteworthy progress has been made by industry itself, but this is limited chiefly to larger corporations. Private inspection services sometimes associated with insurance extension are to be found. These services now work under six recognized standards: (1) physical examinations, (2) treatment of accidental injuries, (3) prevention of sickness including treatment of minor ills with the idea of prevention, (4) sanitation of the plant, (5) personal hygiene instruction, and (6) insurance and compensation adjustments. As a result, there has followed decreased absences, decreased labor turnover, increased earning and increased production in these plants. No doubt, workmen's compensation acts have greatly stimulated these services.

Rector points out that industrial medical work does not antagonize or supplant the private physician, except where he is inadequate to the situation, but actually increases his field of usefulness. However, for a long time to come smaller establishments and the great majority of workers will not be covered by this means and must depend upon the state for advice, assistance and protection.

ORGANIZED LABOR'S ENDEAVOR

Samuel Gompers maintained that organized labor has undoubtedly initiated whatever official health program there is because of the plain necessities such as wages, hours, age limitations, safety and immediate sanitary conveniences. However, organized labor has done practically nothing on such fundamental features

as environmental hygiene and personal hygiene. At present it often shows a tendency to grasp most health factors as political clubs to get more money for less work rather than to get health protection. Organized labor fears new inventions yet the history of inventions repeats itself in showing that the reduction of manual labor by machine processes as, for instance, type-setting, photography, shoe making and pneumatic tool work, has greatly increased the demand for products and raised the wage level. Inventions have often increased the skill and decreased the hours at the same time.

SPREAD OF KNOWLEDGE

An estimation of the increasing knowledge among the working classes is another measure of the development of industrial hygiene. This education has been very erratic and, as before intimated, limited largely to certain establishments and a very few labor organizations. An independent bureau called the Workers' Health Bureau, dealing with organized labor exclusively and on a nonprofit basis, has great difficulty in convincing labor unions of the worthwhile aspect of health work among them. The voluminous annual report of the American Federation of Labor devotes very little space to the question of the maintenance of health.

In many trades and callings, examples of miserable attempts of ignorant workers to better health conditions are to be found, such as those pointed out by Dr. Mary C. Mayers, in New York, in laundries where women are found wearing heavy sweaters to prevent colds in an atmosphere surcharged with humidity and high in temperature; the belief among foundrymen that alcohol is necessary to counteract the effects of poisons; or the breathing of cement dusts and various gases to cure lung diseases, and the starvation cure for lead poisoning advocated by some painters. Almost any critical analysis of work places will bring to light similar beliefs and practices. These beliefs show the real necessity of adequate supervision of the health and lives of workers.

STUDY OF JOB REQUIREMENTS

The evaluation of the fitness of workers and of the requirements of particular jobs is just taking on a scientific character, largely following the methods instituted during the war. Psychological tests show an immense percentage of low levels of intelligence similar to the war draft findings. Many of the individuals in this class are in responsible positions. Many more are doing routine work which is far below their respective levels of intelligence. The Alpha tests and Intelligence Quotient ratings have been highly useful in a number of plants where workers have been fitted to jobs within a few hours when officials would otherwise have taken months or years to come to the same end, and then perhaps never have succeeded.

In regard to physical defects, Quinby recently found that gross eye deficiencies ran 5 to 7 per cent, hernia in man 5 to 7 per cent, gross circulatory defects 2 per cent, gross lung defects 2 per cent, dental defects 10 to 12 per cent. A committee of the New York Academy of Medicine recently found that only 2½ per cent of nearly 1,000 wage earners of both sexes were perfectly healthy and normal, that 72 per cent needed medical and surgical treatment, and 25 per cent hygienic advice.

REHABILITATION

The rehabilitation of injured industrial workers is comparatively new but it is considerably in advance of preventive measures in its support. In fact it even enjoys governmental subvention in the states which will coöperate.

There are many illustrations of successful attempts to fit more or less handicapped workers to jobs, and we see the effort culminating in the Reconstruction Hospital in New York City. There has appeared considerable literature in regard to occupational therapy, not only for the physically maimed but for tuberculous, circulatory and mental cases.

CHILD LABOR

There is little real health supervision of child labor and this little varies greatly between states. Educators, welfare workers, and lay persons, often working independently of physicians and hygienists, are, however, to be complimented on what they are accomplishing in many places. Supervision consists largely in ascertaining the age, and prohibiting occupations with an accident risk. Physical examinations are unknown in most states, and where present include only part of the children employed. In fact, physical examinations of children in one form or another are required in only nineteen states; they are optional in eleven states including the District of Columbia, and omitted in the nineteen remaining states. Reëxamination upon change of occupation and periodic examination have yet to come. A special federal committee has presented a final report upon Physical Standards for Working Children as well as the standards for organization and supervision (Children's Bureau, 1921).

R. Prosser White, in England, says that even after an approval of physical conditions, from the school or family physician, his personal experience shows that 10 to 15 per cent of the young persons who apply for factory work are rejected, conditioned, or especially cautioned in spite of their "certificates of fitness." He points out that the hazards of the job must also be taken into consideration so that job analysis for children, of all others, is essential.

PROTECTION OF WOMEN

Female labor enjoys certain privileges in most states, such as reduction of hours, elimination of night work, prenatal and postnatal absences, prohibited occupations, and rest rooms. Some of these legal provisions are mere verbiage, such for instance as the requirement of a lunchroom unless one hour is allowed for lunch, the requirement that "manufacturing establishments shall furnish and provide suitable seats for the use of female employes, and shall permit the use of such seats by said females when they are not necessarily engaged in the actual duties for which they are employed." (Connecticut, Ohio and others.)

Overtime work and its enforcement for both sexes is similarly juggled in many laws. The hygienic principle emphasized by Vernon is entirely unappreciated, that if overtime is necessary it is much better to increase working hours by a small and regular amount each day rather than to impose two to four hours overtime intermittently.

RELIEF OR PREVENTION

We are quicker to jump at restitution than at prevention. Compensation for industrial sickness is an illustration. It exists in eight states but is limited entirely to specific occupational diseases. In four of these states (Illinois, Minnesota, New York, Ohio) occupational diseases are specified in a so-called schedule. In the four other states (Massachusetts, Connecticut, Wisconsin and California) the inclusion is broader than these schedules but the restitution made by commissions and courts of award is usually quite limited. In general, the controversial exactions in obtaining compensation for an occupational disease are such in most of these eight states that results are lamentable—a few score or less cases being compensated in a great industrial state like New York. I am glad to say that there is an exception in Ohio where, in a paper just published in the *Journal of Industrial Hygiene*, I have shown that a liberal but equitable construction by the Industrial Commission permits the compensation of 95 per cent of the occupational disease claims presented and that less than 7 per cent prove controversial.

When we consider that forty states have not even these provisions, we have not much to evaluate in the matter of compensation for industrial ill health in the United States.

INSURANCE

Health or sickness insurance has greatly extended in recent years. Possibly 15 per cent of all workers are now covered, however inadequately, for sickness, yet the movement is gaining momentum and covering at better rates is consequently coming about.

The most valuable aspect of sickness insurance really lies in the stimulus to ascertain the cause of sickness, and when combined with educational work means much.

CONCLUSION

The real values to be aimed at are: *First*, the essentials for health of all human beings, viz., control of the environment, personal hygiene and physical examinations. *Second*, the fundamentals of industrial health which require that the production of all articles or services of human usefulness must include the cost of the maintenance of health. *Third*, the standards for health, now more or less agreed to by hygienists and sanitarians, need actual application to the working class. These include the specific provisions to guard against some 8 to 10 industrial health hazards and 12 to 15 personal hygiene hazards, and the periodical physical examination of a standard type such as that detailed by the American Medical Association. *Fourth*, organization, both official and nonofficial, for effective administration with qualified personnel. In this connection we have recommended to the last Conference of State and Provincial Health Authorities the proposition that every state health department should have a division, bureau, or even one person at part-time giving attention, not to industrial hygiene, at least at first, but to occupational diseases, believing that the health worker's attention to these end-results of defective health maintenance for the worker will result in an extension of industrial hygiene.

ADDITIONS TO LIST OF MORBIDITY STATISTICS

In the January, 1925, issue of the *American Journal of Public Health* (p. 31) appeared a tentative list of the diseases and pathological conditions which are of major interest in industrial morbidity statistics. The list was constructed by a committee of technicians in industrial hygiene and in vital statistics.

Since this tentative draft was prepared it has been edited and revised by members of the General Committee and the following changes decided upon.

In Class I, title 4, in the parentheses, substitute *2* for *1*.

In Class II, the reference letter following title 6 should be *f* instead of *e*, and the final sentence in footnote *e* should appear as footnote *f*. In footnote *d* (final sentence), substitute *title* for *table*.

In Class III, footnote f, the next to the last word should be *sub-title*.

In Class V, title 3, sub-title a, substitute *see sub-title 4a* for *see next sub-title;* and in sub-title c, substitute *unspecified* for *unspecific*.

In Class VI, title 6, substitute *118* for *116*.

Title 7, sub-title b, delete *110;* and in title 10 insert *110*.

The Class number for DISEASES OF THE SKIN AND OF THE CELLULAR TISSUE is IX, not XI.

In Class X add: 3. Amputations (157), and change the number of the following title from *3* to *4*.

Class XIV, Group A, title 8, sub-title b—the numbers in the parentheses should be as follows: 176, 177, 180, 182, 183, 186 to 192, 195, 196, 202, 203.

Class XIV, Group B, title 10, should be changed to *Other Accidental Causes*, and the numbers in parentheses changed to:

a. Infected wound (202).

b. All others (180, 182, 183, 186 to 192, 195, 196, 202, 203).

A third Group, C, should be added as follows:

C. Suicides and homicides (165 to 174, 197 to 199).

CONTRIBUTORY CAUSES OF DEATH*

IT IS well known but often forgotten by public health workers that the mortality tables do not tell the whole story of the fatality of diseases. These tables, showing as they do only the principal causes of death, give the sanitarian only partial information on which to base his public health program. The contributory causes are often not reported and almost never tabulated. Even if complete information were available to tabulate the causes of death with regard to all contributory causes, it would involve almost endless complication and would put an unbearable burden on statistical offices. In most difficult situations the temptation is to do nothing, but the Vital Statistics Section of the Association believed that the matter should not be dismissed merely because it was difficult, and at the Boston Annual Meeting, in October, 1923, following the reading of the papers,† "Contributory Causes of Death, Their Importance and Classification" by Dr. Louis I. Dublin and George H. Van Buren, and "Uniform Classification of Joint Causes of Death" by John O. Spain, appointed a committee of seven to study the subject of contributory causes of death and report at the Detroit meeting. This committee offers a program which might be fruitfully followed for the present, at least. The report of the committee is short, practical and to the point. It is given herewith in full.

REPORT

1. It is the sense of the committee that a wealth of information is contained in the reports of secondary or contributory causes of death; and that large vital statistics offices are in a position to make valuable contributions to vital statistics, clinical medicine and public health knowledge by compiling and publishing, at more or less frequent intervals, statistics on contributory causes.

2. The committee believes that three distinct services are rendered by such statistics. The first of these is to show the extent to which certain diseases are important factors in causing death *above and beyond* the number of times recorded in tables of primary causes. The second service is to show the extent to which each primary disease is associated with each other disease. The third service (which supplements the second) is to show how many times a given disease was secondary or contributory in fatal cases to any other given disease.

3. The committee recognizes that it would be impracticable for offices which classify large numbers of deaths to publish statistics of contributory causes annually. It believes that for the present at least, such offices should, whenever possible, publish such reports at least every five years.

4. The committee recognizes that, granting the real need for statistics of contributory causes, there should be established at least a groundwork for a standard procedure in classifying them for statistical tabulation. Without standardization of practice, such statistics, when compiled by different offices, would not be comparable. If, as the committee hopes, large vital statistics offices take up the compilation of statistics of contributory causes, the Bureau of the Census should draw up a list of general rules for use in classifying such causes.

5. The committee also recognizes that there are almost insurmountable difficulties which prevent showing in statistical tables *all* of the reported contributory causes. It believes that for the present, at least, no more ambitious program should be contemplated than that involved in the tabulation of the *principal* contributory cause. It further recognizes that the method of selecting such principal con-

* Report of the Committee on Contributory Causes of Death presented to the Vital Statistics Section of the American Public Health Association at the Fifty-Third Annual Meeting at Detroit, Michigan, October 22, 1924.

† See *A. J. P. H.*, Dec., 1923, and Feb., 1924.

tributory causes constitutes the most difficult problem that has to be solved before vital statistics offices can hope to produce real, worthwhile, comparable, statistics of contributory causes.

6. One important question that arises is: Is there a fundamental distinction between a *contributory* and a *complicating* cause of death? In any given case is it more important to record the fact that there was involved a certain disease which more or less frequently complicates the primary disease than it is to show that some other intercurrent condition was present? As an example: Is it more important to show how many cases of gastric ulcer terminated in peritonitis than it is to show the number of stomach ulcer cases in which chronic nephritis or valvular heart disease were involved? Is it more important to determine in how many deaths from pellagra there was insanity (a frequent result of pellagra) than it is to determine in how many instances chronic nephritis, or acute endocarditis, or chronic bronchitis, was associated with fatal pellagra cases? Is it more important to determine the number of deaths from measles in which the terminal condition was bronchopneumonia, or otitis media, than it is to show the number in which decedents had chronic cardiac disease or other conditions? The committee believes that much important information would fail of record if in all cases a third disease should be tabulated as the contributory cause, to the exclusion of certain obvious complications of the primary cause. This is particularly true, it is submitted, in the case of epidemics, where the epidemiologist is more interested in knowing the extent to which any given epidemic disease terminated in certain frequent complications, than he is in knowing how many times some intercurrent condition (having no apparent relationship to the epidemic disease) was involved. It is nevertheless apparent to the committee that there would also be more or less loss of valuable data if no record were made of the existence of these other diseases. The committee feels that this question should be discussed in the Vital Statistics Section and that, if possible, the Section itself should determine by vote as to the better procedure.

7. There are certain reports of causes of death which show by their very names that more than one disease factor was involved, but which, at the same time, are allocated by the International Classification to a title-heading carrying the name of but one disease. Examples are "rheumatic endocarditis" and "diabetic gangrene."* The committee recommends that in instances like these the case be codified under the primary heading indicated by the International List and that the other condition be tabulated as contributory. Thus, in the case of diabetic gangrene the death would be charged to diabetes as the primary cause and to gangrene as the contributory cause. It recommends, however, that the Vital Statistics Section consider how far this principle should be carried out, for example, whether the procedure should be the same in dealing with syphilitic rheumatism, tuberculous pleurisy, malarial hepatitis, malarial anemia, scarlatinal nephritis, gonorrheal endocarditis, rheumatic pleurisy, etc., etc.

8. In the case of violent deaths the committee believes that more will be gained by recording the nature of the injury as the secondary cause than by recording the fact that the decedent also had some disease. For example, in a fatal automobile accident involving fractured ribs and pneumonia the fracture should be tabulated rather than the pneumonia. In a mining accident, asphyxiation, or fall should be recorded rather than the existence of some disease.

9. The committee recommends that what might be called the context of certain terms be carefully considered in classifying contributory causes. For example, if the report be "gastric ulcer and hemorrhage," the committee believes that the sensible procedure would be to classify the contributory causes under "other diseases of the stomach" where *gastric* hemorrhage is classified rather than under "other diseases of the circulatory system" where *hemorrhage*, unqualified, is classified.

10. The committee fully recognizes that statements of contributory cause do not appear on death certificates in a considerable percentage of the cases in which contributory causes are factors. In the interest of more accurate compilation both of primary and contributory causes, the committee wishes to record its entire sympathy with the efforts that have been and are being made by vital statistics offices to obtain more complete reports of cause of death; and to urge even greater activity along this line in all cases where this is practicable. This will result,

* These are charged to acute rheumatism and diabetes mellitus, respectively, in tables showing primary causes only.

inevitably, in greater accuracy of tables based on primary causes, inasmuch as full and specific statements of all conditions causing death have an important bearing on the allocation of any given case to the proper title-heading of the International List.

It has not been practicable, for geographical reasons, to bring the committee together for oral discussion of its problems.

The committee suggests that it be continued for another year, and that it send to a list of prominent clinicians and epidemiologists, as well as vital statisticians, in the United States, Canada, and other countries, copies of this report with requests for their opinions as to the best procedure in the premises. The letters to the physicians should bring out opinions as to the questions raised in paragraphs 6, 7, and 9 of this report. Those to vital statisticians, it is hoped, will throw light upon the various statistical aspects of the whole question. In the case of certain foreign statisticians who have already done more or less work in compiling contributory causes, requests should be made for as full as possible a statement of how they proceed in dealing with some of these questions.

One of the members of the committee was the late Dr. Sylvester J. Byrne, of Brooklyn, Assistant Registrar of Vital Statistics, of New York City. Dr. Byrne died December 5, 1923. His judgment would have been extremely valuable to the committee, as he codified both the primary and contributory causes of death in Brooklyn Borough for many years. The committee takes this occasion to express its sincere regret at the death of Dr. Byrne and would adopt a formal resolution to that effect were it not for the fact that such action will doubtless be taken by the Vital Statistics Section itself.

GEORGE H. VAN BUREN, *Chairman.*
WILMER R. BATT,
M. O. HECKARD,
W. A. PLECKER,
JOHN O. SPAIN.

After the reading of the foregoing committee report, the following resolution was introduced and adopted by the Section:

WHEREAS, it is the sense of the Vital Statistics Section of the American Public Health Association that a wealth of information is contained in the reports of secondary or contributory causes of death and that large vital statistics offices are in a position to make valuable contributions to vital statistics, clinical medicine and public health knowledge by compiling and publishing at more or less frequent intervals, statistics on contributory causes Therefore, be it

Resolved, that the Section hereby expresses its appreciation of the value of the table of contributory causes which was published in the 1918 Mortality Report of the Bureau of the Census, and requests that Bureau to publish similar tables with suitable text analyses, as frequently as practicable.

THE HEALTH WORKERS' POINT OF VIEW*

PHILIP P. JACOBS, PH.D., FELLOW A.P.H.A.
Publicity Director National Tuberculosis Association

IN discussing newspaper publicity from the health workers' point of view, it is hardly necessary before a group of this character to remind you that we must start with the basic assumption that all publicity must be continuous. An occasional newspaper story may have some value, but if the health officer and the health worker are to use the newspaper to the best advantage, they must look upon this medium of education as one part of a continuous campaign designed to keep the health message before the public 365 days in the year and 24 hours in every day. Only by conceiving of the newspaper in this way will the utmost value from this great medium of education be achieved.

We may well take a leaf out of the salesmanship of such popularly advertised articles as automobiles, chewing gum, cigarettes, or soap. Every advertising agency and every manufacturer of such articles knows that if he were to stop the continuity of his message, the sales of his particular product would fall off immediately. The more continuous and the more broadcast the message, the greater would be the diminution of sales if the advertising and publicity were discontinued.

Starting then with this assumption that our newspaper publicity is part of a continuous campaign, we must recognize also that this method of publicity is to be supplemented in turn by such methods as the use of circulars, posters, dodgers, and similar forms of printed matter; the spoken word before all types of audiences and through the radio; the stunt and graphic presentation by exhibits and in more or less spectacular ways; and by combinations of all of these methods.

Thinking, therefore, of the newspaper as only one means of getting our continuous message to the community, I wish to talk for a little while upon the health extra sheet prepared through the courtesy of the *Detroit News*.† If you will study the 21 articles on this page, you will find that you can group them in a number of different ways. I have chosen a series of groupings which may be more or less arbitrary, but which indicates to my mind something of the character of articles that health officers are usually asking the newspapers to print. For example, I find an article on milk as a food and another one on the regulation of the milk supply; there is one on headache; there is another on diphtheria and still another on lockjaw and food poisoning; one on garbage removal and another on nuisance are closely related; there is still another one on typhoid, two articles on rabies; one on scientific research real or pseudo; one on contagious diseases in general; two on child health; one on infantile paralysis, and one on flies. This grouping of the series of articles, which as I have said is more or less arbitrary, gives you the types of subjects being covered in the day's news by city health departments. I dare say that if we took one hundred or two hundred additional articles from city

* Read before the Health Education and Publicity Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 23, 1924.

† Reproduced in The Newspaper Man's Point of View, Lee A. White, A.J.P.H., Jan., 1924, p. 5.

health departments, we would not find a great deal of variation from this group of topics.

Now look at a few of the articles themselves. I haven't time to discuss each one in particular, nor would it be profitable to do so. There are very few points of interest and help that we can gain from a study of these articles. I call your attention to the one entitled "Says Headache Warns of Danger," which appeared in so prominent a paper as the *New York Times*. This is an excellent example of creating news. The most difficult problem that confronts the average health officer from the point of view of newspaper publicity is that of seeing the news in the day's work, or creating it out of the ordinary grist in his office.

A newspaper like the *New York Times*, or any other well regulated newspaper, will not publish anything but news. It is important, therefore, if we are to keep our message continuous, that when news does not break in a spectacular manner, as too often it does not, we must be able to create it out of the more or less commonplace. Here is an illustration of how it can be done. A man gives a radio talk (or the talk might be given before a regular audience). There is nothing unusual about an individual giving a radio talk, but because the man has a reputation and because he has done some particular thing, the mere fact that Dr. Munson says makes it news. This puts the timely element into matter that ordinarily is nothing but pure editorial comment and is not at all acceptable to the average newspaper.

I call your attention to another illustration of creating news by means of a stunt as is shown very happily on this page. Note the article headed "Milk Only Fuel, Five-Car Train Hauled 6 Miles." This is an excellent illustration of how one can create news and focus public attention upon a commonplace health fact by a spectacular stunt. It is a graphic method of presenting the value of milk as fuel. There were hundreds of health workers in Chicago who knew that milk is an excellent food and therefore an excellent fuel for the human engine, but it remained for Dr. Bundesen to focus attention upon this fact and thereby increase the use of milk as a food by such a spectacular stunt as having a five-car train hauled six miles with milk as the only fuel. One may overdo this type of stunt, but now and then it pays for the health officer to create news by the spectacular focusing of attention upon a perfectly commonplace fact.

At the bottom of the first column of the sheet is a story headed "Bulletin on Death of President's Son." Here is an effort to create news about the danger of ordinary blood-poisoning through a timely story of a well-known individual. The idea of this is good, but the story is very poorly presented. It would have been a much better story if the substance of the article had been put in the mouth of the health officer and if, instead of having been issued impersonally, it had been issued as an interview or a statement by some individual.

In the story entitled "Infantile Paralysis Advice Given in Medical Bulletin," you have a type of story that is quoted and is therefore newsy, but is impersonal. This has its value, but it is not nearly so useful as the personal story. Generally speaking, newspapers and their readers are much more interested in what an individual says than in what a society of individuals says. For example, compare this story with the one entitled "Diphtheria Is a Child Menace." Here the health officer himself, a well-known city official who happens to be with us today, tells the people what he knows to be facts with regard to diphtheria as a child health menace.

The story entitled "Vacation Warnings" is good enough so far as the material in it is concerned, but the story signed as this one is, "Bulletin issued by the Board of Health," is very apt to get poor space in any well-run newspaper, if it would get any space at all. Some prominent individual, physician or lay-

man, could take the same facts and say them as Dr. Carlton has done in his particular story that I have already referred to, and make them real and alive.

The story entitled "Child Health Centers in Family Unit" is an excellent example of good publicity. Here is a story that is well presented with a good lead. The first paragraph tells all there is in the story, which is proper newspaper technique. You do not have to read the rest of it if you do not wish to. It gives some scientific information in a dignified, simple way, but with a personal touch—a human interest story.

As to the story entitled "'Let us Flee,' Said the Fly, So They Flew Up the Flue," I am not very strong for this type of story. It may have its place on a feature page, but I question very much whether this type of facetious story is nearly as good education as a much more straightforward story such as those on which we have already commented.

The story headed "Disease," is an effort to present a news story freighted with editorial comment. To be sure, some newspapers are not very discriminating and will print a story that has editorial comment in it, which by the way is no proof that the story is a good one. People often show me clippings of stories that they think are good because they have been printed. The proof of the story is not the printing, but the reading, and experience demonstrates perfectly well that a story to be read must be presented in a newsy way. The technique of good newspaper writing requires that editorial comment be left to the editorial page.

If I judge the newspaper publicity of health departments correctly from a study of this sheet and from a more extensive and continued study of numerous bulletins and press stories that come to my desk almost every day, it seems to me that a great majority of health officers are losing a tremendous opportunity for keeping themselves and their message before the people simply by not being able to use the news in the day's work.

Some folks say that it takes the sixth sense of a newspaper reporter to see news. I grant that there is something in the training that a newspaper reporter gets, but the ability to see news is not necessarily limited to a few selected individuals connected with newspapers. Anyone can, if he or she will, see the news in the day's work, and can cultivate that power of observation simply by observing.

Not everyone can write the day's news. The first thing is to see it. The matter of writing can be left to a reporter. It is not necessary to keep one's self or one's department on the front page of the newspaper every day. The average newspaper will soon get sick and tired of that kind of publicity, but if the newspaper is to be part of the continuous educational campaign that we have conceived in the beginning of this talk, the health officer must be able to keep himself in print much more continuously than he now does.

Take again for example the story on diphtheria. Dr. Carlton out of the day's work was able to find a story on this disease and in a few minutes' conversation, stressing some of the high lights, gave a reporter enough data to fill practically a column in the daily paper.

To illustrate how easy it is to overlook news, Dr. Kleinschmidt, who is probably better trained in matters of this character than most of us, told me this morning of a reporter who came into his office last week and asked him if he had any news. He replied, "No, there isn't any news this morning." Then he told the reporter that he had been too busy to give the matter thought, because he was working on a motion picture. The New York Central Railroad had loaned him an engine and an engineer and he was using this material to make a motion picture on the value of physical examination. The reporter at once said, "Here is a bully story," and proved to Dr. Kleinschmidt, in what seemed to him a barren morning, that this was a very good feature story.

Let me illustrate a few types of story that come within the ordinary day's work

of the average health department. Take, first of all, the case story. Every health department has case stories. For instance, there are cases of contagious and infectious disease; people are in quarantine for this, that and the other disease. They observe quarantine or they do not observe quarantine. The quarantine for whooping cough, for instance, is very much discussed at the present time, and the question of whether an arm-band should be worn to distinguish the child with whooping cough is a moot one. Any health officer can find in his day's work news stories on cases that he can disguise as far as names are concerned and that will give news which the public wishes to know about and should know about. Take the carriers also—carriers of tuberculosis, carriers of diphtheria, carriers of typhoid. They are always an interesting story and what happens as a result of the carrier can always be made to convey a strong educational message to the public as to the danger of transmitting disease.

A sob story can occasionally be used to advantage, although this is probably the least useful of the health officer's case material. The question that needs to be considered is not whether it appeals to the health officer. You and I are probably more or less "hard boiled" on matters of this character. What is needed is an ability to see what will appeal to the man on the street.

Take another division of the health department—the division of vital statistics. The quantity of news stories that is waiting in this division and needs only to be dug up is simply amazing. There are stories about the age and sex incidence of contagious diseases in general or of particular diseases; the occupational incidence of certain industries with referance to community health; figures as to the geographical distribution of certain diseases. Such stories can always stimulate rivalry in one section or one ward as against another.

Or take the laboratory. Every health department laboratory is developing news that is of great interest. The mere summary of the work done is of importance, provided the summary is interpreted in simple terms by someone who knows how. More than that, the newspapers are constantly carrying articles sent in by cable or otherwise about marvelous cures or wonderful scientific discoveries that have a bearing upon public health. The laboratory technician can contribute to the clarification of these reports by commenting upon these stories.

Or, take the food and drugs division. There is a veritable gold mine of news here. The hazards of food handlers and the hazards of the ordinary patron of restaurants where food and food handlers are not properly supervised offer only one line of publicity suggestions. The drugs, quacks, vaccines, etc., are another line of stories, and when one comes to a consideration of food values, such as the caloric values of certain types of food, there is an infinite variety of news material. For instance, during the summer months what greater service can the food and drugs division do than to tell the public by interviews at frequent intervals the value of such vegetables as corn, spinach, or potatoes.

When one comes to the administration division, there again are numerous stories that I need not stop to point out. I think, however, that I do not exaggerate when I say that there is abundance of news in almost every activity and every division of the average health department. All that is needed is for the health officer to give the facts of his day's work timeliness and local color in order to make them available and useful to the newspaper.

THE RELATIONSHIP BETWEEN DIFFERENT ANTIBODIES*

ANNA W. WILLIAMS, M.D.
Health Department Laboratories, New York City.

STUDIES on strains of hemolytic streptococci from different cases of scarlet fever, from normal throats and from cases of other diseases are being carried on by workers in our laboratory along three main lines:

1. Grouping by agglutination and absorption of agglutinins. In these studies we have been assisted by H. D. Hussey, F. Bittman, A. Brassel and others.

2. Grouping according to the protective power of serum stimulated by the inoculations of whole cultures. This part of these studies has been carried on mainly by C. R. Gurley, M. F. Carmichael and F. Berman.

3. Grouping according to the power to produce toxic filtrates neutralized by convalescent scarlet fever serum, and by serum from horses inoculated with a toxic filtrate. We have been assisted in this work by H. D. Hussey, A. Brassel, B. Kolchin and others. Most of the human inoculations were made by A. Zingher and R. G. Freeman.

The main purpose of all of these studies has been to determine the relationship of hemolytic streptococci to scarlet fever and to so-called natural immunity from scarlet fever.

In regard to grouping by agglutination, we have found that out of about 70 strains tested, only about 30 per cent fall into one group; 7 per cent consist of two small groups, one of 3 strains and one of 2 strains; about 63 per cent do not fall into these groups.

The strain of Dochez, Avery and Lancefield "No. 273" which they first listed in their work on agglutination[1] as coming from a case of scarlet fever,† belongs according to the absorption test to our heterogeneous group, but the strain Dochez gave to Dr. Huntoon who kindly sent it to us labelled "No. 1372" falls by the absorption test into our dominant group which we have called Type I group. Two strains kindly sent us by the Drs. Dick labelled "No. 1" and "No. 2" both fall into this Type I group.

Eight per cent of strains from sources other than scarlet fever fall into our Type I group—2 in 25. One of these was from a wound and the other from an endocarditis case.

In view of the fact that only about 30 per cent of our strains from scarlet fever fall into one group, we conclude that the agglutination test, whatever the significance of the occurrence of such an agglutination group among scarlet fever strains, is not of much practical worth in the diagnosis of scarlet fever or in the identification of carriers.

In regard to grouping according to their power to stimulate the production of antibodies protective in mice against whole cultures, all of our strains from scarlet fever so far tested and our 2 strains from sources other than scarlet fever fall into one group.

We have not studied by this test many of the strains studied in our agglutination work, chiefly because of the difficulty in raising the virulence of some strains, but

* A Report of Studies on Scarlet Fever by Workers in the Bureau of Laboratories of the New York City Health Department. Read before the Laboratory Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 21, 1924.

† Kindly sent us by Dr. Dochez.

we have tested enough strains to demonstrate that this power to stimulate the production of protective antibodies is probably broader than the power to stimulate agglutinins.

Thus, while our two strains F and K from other sources, one from a wound and one from endocarditis, are controlled by our Type I serum, one of our measles strains M 22—which falls into our heterogeneous agglutination group is controlled as well. We have so far raised the virulence of 19 strains to a ten millionth of a cubic centimeter or less as a lethal dose for mice—13 from scarlet fever and 6 from other sources.

In regard to the third line of these studies—studies on toxic filtrates—we have tested many strains of hemolytic streptococci for their power to produce neutralizable toxic filtrates.

We have found that not only do all of our scarlet fever strains tested, which were isolated over 3 years ago, produce such a toxic filtrate, but all pyogenes strains isolated from a very recent series of scarlet fever cases do the same.

Our two strains from sources other than scarlet fever that fall into our protective group, and therefore into our agglutination group do the same. Also 2 strains that are not protected by our Type I serum and that do not fall into our agglutination group—one from osteomyelitis, and one from bronchitis produce neutralizable toxic filtrates.

Some strains from sources other than scarlatina, but which belong to the pyogenes group, and a few outside of the pyogenes group have either not produced toxic filtrates or have produced toxic filtrates that are not neutralized by scarlet fever convalescent serum or our horse serum.

We have examined a series of 25 cases of excised tonsils with a history of no recent exposure to scarlet fever. From 56 per cent of these (14 cases) hemolytic streptococci were isolated and 42.8 per cent of these (6 cases) produce toxic filtrates neutralized by convalescent scarlet fever serum. These strains have not yet been tested by agglutination or by mouse protection.

In this connection it is interesting and significant to report on our comparative results in protection in mice against the living culture with serum from horses inoculated with toxic filtrates and from those inoculated with whole cultures of these streptococci from scarlet fever. Our whole culture streptococcus serum affords marked protection in mice against all of our strains protected by our Type I rabbit serum, while our toxic filtrate horse serums which are yielding a serum having a high neutralizing value, do not yet protect at all.

The serum from Dochez' first bleedings that he sent us do not protect either, but Dochez now states[2] that he has a serum that protects against the whole culture and neutralizes the toxic filtrate as well.

These facts add to the evidence in favor of certain hemolytic streptococci being the cause of "scarlet fever."

But they point toward the probability of "scarlet fever" being only one of the manifestations of infection by a large group of these cocci.

They suggest that while immunizing with toxic filtrates may prevent clinical scarlet fever it may not prevent the more serious effects of hemolytic streptococcus infections. They also suggest that serum stimulated by the inoculations of toxic filtrates alone may not be so effective a curative agent as one stimulated by the simultaneous inoculations of toxic filtrates and whole cultures of the streptococci.

They finally raise the interesting question as to the possibility of there being strains of hemolytic streptococci in the throats of many people which, while not causing clinical scarlet fever, may produce immunity from such a condition.

[1] *J. Exper. Med.*, 1919, 29, 215.
[2] Personal Communication.

MOSQUITO CONTROL IN NEW JERSEY DURING THE BREEDING SEASON OF 1924*

LEWIS E. JACKSON

Executive Secretary Hudson County Mosquito Extermination Commission of New Jersey

MORE than a million and a half feet of new drainage ditches were cut in New Jersey during the 1924 season. There are now more than 5,000 miles of ditches, calculated on the basis of 10 inches in width, the standard of measurement adopted in the state. Three hundred and thirty thousand dollars was expended in mosquito control measures this season, including both permanent and necessary maintenance work, clearly showing the extent of progress there. About 20,000 feet of new dikes were constructed and several large tide gates were added to the many previously built.

The benefits of the mosquito control carried on are apparent in the results attained. In several of the 10 counties actually engaged in the work in the formerly mosquito ridden New Jersey there were practically no mosquitos this summer. This very favorable condition prevailed particularly in the thickly populated metropolitan district, thus providing protection to vast numbers of people. Annoyance in the counties in the southern part of the state along the Atlantic seaboard, embracing the well-known sea shore resorts, was reduced to such a low point as to call forth very general commendations. Decided progress is being made by improved methods, step by step, toward the coveted goal of absolute control of mosquito breeding.

One outstanding feature in the advance in salt marsh work lies in the use of machinery. A ditch cleaning machine, outlined at the Boston meeting, was perfected this year. The machine is the result of several years' study and experiment by The Associated Executives of Mosquito Control in New Jersey. Its success is due principally to the genius and perseverance of Mr. Fred A. Reilly of Atlantic City, who designed and directed its construction with funds furnished by the State Experiment Station.

The details of this machine may be of interest to you. It is mounted on a structural

steel frame carried on two caterpillar wheels, 26 inches in width, with wheel base of 8 feet. The motive power is a Fordson tractor, from which the wheels have been removed. The caterpillars are driven by a link belt connected with the main axles of the tractor. A braking device enables the machine to be steered and

* Read before the Sanitary Engineering Section of the American Public Health Association at the Fifty-third Annual Meeting at Detroit, Michigan, October 23, 1924.

turned in a little more than its own length. The cleaning is done by a trough containing a steel screw conveyor. One end of the trough is hinged to the frame work, the other end is dropped into the ditch to be cleaned. The material brought up by the conveyor is delivered into a horizontal trough attached to the frame at right angles to the line of the ditch. A screw conveyor in this trough carries and dumps the material to one side, beyond the caterpillar tread. The total weight of the machine is 5 tons, with a square inch ground pressure of but 2 pounds. The average operating speed is 1,100 feet per hour.

The machine as at present constructed, is designed to clean ditches in the clear meadow 10 inches wide with parallel sides to a depth of 2 feet, but it can be adapted to ditches of other dimensions. It is estimated that similar machines can be built at a cost of between $3,500 and $4,000. Its average capacity is 6,800 feet of ditches cleaned per day of 8 hours. It is operated by two men. The cost per linear foot of ditch cleaned, including all overhead and depreciation, is the remarkably low figure of one-third of a cent. The result is practically a new ditch. At the current rate for hand work, the machine will pay for itself in nine weeks.

The completion of the ditch-cutting machine described to you last year could not be effected, owing to the lack of funds available to the State Experiment Station for certain important changes. The tests have been

completed and the design of the machine decided upon. The digging will be done by a series of collapsible metal buckets, mounted on an endless belt, driven by a 5 ton Holt tractor, which will also provide the motive power for the caterpillar carrying the frame upon which the entire plant will be mounted as one unit.

It is anticipated that the cost of ditching with this machine will be about one-half of a cent per linear foot. When compared with the present cost of two to three cents, it becomes apparent that the use of the new machine will render possible rapid and economic ditching work.

Other activities along the lines of progress in mosquito control include: The study of the important problem of mosquito repellants; experiments of the effect of acids and sulphates on larvæ in both salt and fresh water, and broadcasting mosquito control lectures by radio for the purpose of securing the coöperation of the people. Two standing committees of the Associated Executives have been established to determine by study, experiment and practice the proper standards in mosquito control work on the enclosed and open salt marshes and have reached definite conclusions on several features of that important branch of mosquito control.

IS THE INDIAN SUSCEPTIBLE TO HEALTH EDUCATION*

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THE need for public health measures among the Indians is shown by reports of the Bureau of Indian Affairs, the United States Public Health Service investigation into the prevalence of contagious and infectious diseases in 1912, the National Tuberculosis Association report on Tuberculosis Among North American Indians, also published in 1923 by the Senate Committee on Indian Affairs, and numerous other reports from official and unofficial sources. In these documents references will be found covering the tribal and the religious customs in different parts of the United States. The personal habits and occupations of the Indian, like his environment, must be considered in relation to his probable susceptibility to health training.

Recently Dr. Hubert Work, Secretary of the Interior, appointed a committee of one hundred, which met in Washington, and stated the Government's Indian policy as follows:

> It appears that the main points aimed at by the Government, as indicated in its legislation, the administration of the Indian Office, and by all friends of the Indians, as expressed in their conference and publications, are as follows:
>
> 1. The training of all Indians for American citizenship, and their ultimate absorption into the citizenship of the country.
>
> 2. An educational policy which will provide suitable schools for all Indian children.
>
> 3. The promotion of the health of Indians living on reservations by the enforcement of suitable hygienic and sanitary regulations and by adequate medical and surgical service.
>
> 4. The enforcement of law and order on all Indian reservations.
>
> 5. The gradual distribution, as individual competency shall be established, of all tribal lands and funds to their owners in severalty, to the end that each Indian may ultimately have complete responsibility for such property as equitably belongs to him.
>
> 6. The complete and final adjustment of all Indian claims, involving an accounting to every Indian tribe as to all matters affecting lands or funds wherein the Government holds a fiduciary relation.
>
> 7. The codification of all laws and treaty obligations relating to the Indians, with a view to the removal of the present complexity and confusion.
>
> 8. The conservation and utilization of natural resources, with a view to making the Indian Service more nearly self-supporting, and also with a view to the discontinuance of the influences which tend to pauperize the wards of the Government.

* Read before the Conference of State and Provincial Health Authorities, Lansing, Michigan, June 17, 1924.

In Minnesota about 10,000 of 13,000 Chippewa Indians already are citizens of the state. Looking forward to the time when the state must assume full responsibility for Indian welfare, a tentative plan for coöperative work by state departments has been made. This plan provides that the State Board of Health take the first steps. The State Board of Control, with supervision over hospitals, sanatoria, custodial institutions, also the schools for dependent children, the blind, the deaf and the feeble-minded, begins its work to supplement the health work along general welfare lines. Then the State Department of Education and the Department of Agriculture will join in a definite program to fit the Indian by education and training to compete successfully with whites under the rapidly changing conditions affecting his life. Good roads make accessible to whites the territory once the exclusive hunting ground of the Indian. He can no longer move on, as he has no place to go; so he must adjust his life to the new conditions.

In some ways the Chippewas in Minnesota have benefited by changing conditions, but the health situation has not improved much in spite of the efforts of the Bureau of Indian Affairs. For example, during the United States Public Health Service survey in 1912, Surgeon Taliaferro Clark examined white and Indian children in public schools of certain localities. Again in December, 1922, he made trachoma examinations in some of these places, while Dr. L. L. Culp, the eye expert of the Bureau of Indian Affairs, made examinations in the remainder.

Briefly, the findings were as follows: Becker, Cass and Mahnomen counties public schools showed in 1912, 1 Indian to each 18 white children examined; in 1922, 1 Indian to each 3 white children examined; 1912, active trachoma cases among Indians in school, 3.8 per cent, and in 1922, active trachoma cases among Indians in school, 6.3 per cent. This means about twice as many infectious cases in school, with about six times the chance for spread to whites through association with Indians.

But this may not mean an actual increase in trachoma, since in 1912–1913, among 52,847 examined in 25 counties, 1.15 per cent had trachoma: Whites, 1 active case to each 640 of 49,305 examined; and Indians, 1 active case to each 7 of 3,542 examined.

In 1922, among 13,919 examined in 104 schools of 11 counties, whites showed 1 active case to each 387 of 13,157 examined; Indians showed 1 active case to each 18 of 762 examined.

Although the State Board of Health has requested funds for trachoma work at every session since Dr. Clark's first trachoma survey in Minnesota in 1911, the legislature never has seen fit to make appropriations. The Surgeon General, at the request of the State Board of Health, has aided by demonstration clinics in Indian territory and in St. Louis County, where most trachoma among whites is found; arousing the interest of the people and the doctors through the improvement or complete cure effected by the clinic treatment.

In 1923 an appropriation of $10,000 for trachoma work in Minnesota during the present biennium was lost through an accident in a committee, although the sentiment of the legislature was favorable. Doubtless, in 1925 an appropriation will be granted.

My belief that the American Indian is susceptible to training in modern preventive health measures is based entirely upon observation of conditions among the Chippewas in Minnesota. Our good friend, Dr. S. J. Crumbine, Director of Public Health Relations, of the American Child Health Association, shares this belief. Dr. Crumbine spent several days in Indian territory visiting the homes of the Indians and talking with them himself or through an interpreter and with Bureau officials, doctors, missionaries and other white people who live among the

Indians. He found in birch bark tepees, in tar paper shacks and in the best houses, some of which equal any owned by whites in the vicinity, photographs of Indians who volunteered and served with distinction over-seas in the World War. He met Indians who had returned, and observed the improvement in personal hygiene which army life had effected. His observation and inquiry on all sides showed that all the Indians have a deep interest in the welfare of their children. This interest was shown by all Indians regardless of their circumstances, and it was evident that the unnecessary sickness among babies and children was not due to indifference, but simply to lack of means or understanding of what ought to be done to safeguard the health and welfare of the children.

Dr. Crumbine saw many sick babies tenderly cared for by their parents who had no idea of what ought to be done through medical and nursing care, feeding, etc. Mothers dying of pulmonary tuberculosis were seen fondling nursing babies and young children in bed under conditions where precautions were impossible and everything unfavorable to the patient and the children.

Dr. Crumbine made certain suggestions: First, that Chippewa nurses be employed to undertake public health work. Experience shows that little progress has been made by white nurses, field matrons, or other workers among the Indians. Considering that the Indian nurses know the customs of the people, understand their point of view and speak their language, it is believed they might earn the confidence of the Indians and induce them to do the things which would benefit the children. Actual service to a sick baby would afford the introduction to a family. Naturally, the nurse's influence would extend to mothers and to children, and in benefiting them, the whole family and band would be actually benefited and would have a practical demonstration, of which we believe the Indian will take advantage, and follow with marked change for the better in health conditions.

To enable the State Board of Health to employ Chippewa Indian nurses, Dr. Crumbine recommended that the American Child Health Association allot $3,000 to the Board. Mr. Courtenay Dinwiddie, General Executive, approved Dr. Crumbine's recommendation; and upon depositing the $3,000 in the State Treasury, the board secured the balance of the Sheppard-Towner allotment unmatched by state appropriation. Miss Grace Abbott, Chief of the Children's Bureau, and Dr. Ethel Watters heartily approved the project and have used their influence to promote the work.

As the Indian problem had been studied for years by the state departments, Mrs. Blanche L. LaDu, Chairman State Board of Control, and a member of Dr. Work's Indian committee of one hundred, made a plea which resulted in Dr. Crumbine's second suggestion being carried out. This suggestion was that the abandoned Indian boarding school at Onigum, Leech Lake, be remodeled for use as a tuberculosis sanatorium for Chippewa Indians. The project received the endorsement of Secretary Work and Commissioner Burke, and Congress appropriated $50,000 to remodel the building and to maintain the institution for the present fiscal year.

Dr. Crumbine's third suggestion was that arrangements be made for the training of Indians as public health nurses and for other purposes, so that the state agencies might employ qualified workers to carry out the plans for the future.

Dr. Robert E. L. Newberne, Chief Medical Supervisor, Indian Field Service at Large, visited Minnesota, and, in conference with the Minnesota State Board of Examiners of Nurses, offered to change the present curriculum at Haskell Institute, or to substitute that of the Board of Examiners of Nurses in order that graduates of the school be satisfactorily prepared for the nurses training courses of the Ancker Hospital, St. Paul. Graduates of this hospital are eligible for

special public health course at the university.

Further, those Indian nurses whose present training does not fully comply with the requirements for registration in Minnesota are to take, in Ancker Hospital, such additional training as the board may deem necessary, according to the merits of the individual case, and then become registered nurses. In our opinion, no matter how well trained the nurse may be, the essential factor in her work among the Indians will be her personal qualifications. Certain nurses not eligible to registration have these qualifications. With some additional training they are eligible to registration and will become immediately available for the work.

Other departments, Education, Agriculture and Board of Control, have in mind the training of workers needed to carry out their part of the Indian program.

Two Chippewa Indian nurses are working under Dr. Ruth E. Boynton, Director, Division of Child Hygiene. The State Federation of Women's Clubs has provided supplies and materials needed by the nurses which could not be purchased legally with federal or state funds. Mr. P. R. Wadsworth, Superintendent, Consolidated Chippewa Agency, Minnesota, has enthusiastically supported this enterprise from the beginning, and has aided in many ways in the success of the work.

The Federated Club women will raise money to make up for the cut in the American Child Health Association gift this year resulting from the lack of funds of the Association, not from lack of interest. Thus far the work of the Indian nurses appears to be very successful. The Indian mothers and older girls are being taught in classes and in their homes how to feed and care for babies and children. Prenatal and baby clinics have been held, and many fathers have walked miles to attend with the mothers and children. The nurses' services and advice are in great demand and they are welcome everywhere. The work of the bureau physicians in the field and in the hospital has been made more effective by the nurse.

We have begun this work believing that the Indian is susceptible to training in modern preventive health measures. We expect to make slow progress and many mistakes, but, with patience and perseverance, to achieve a measure of success that will be fully justified by the cost to the state.

Dr. Crumbine reports that on his recent visit to Wisconsin, he found a great improvement in conditions, and the Indian Agent of the Wisconsin Indians, Mr. Wadsworth, stated that the acid test of the service of the Indian nurses is that the Indian is calling for them constantly. The demand has also spread over into the state of Wisconsin, where a like service is organized. The boarding school at Onigum has been remodeled and is in operation as a sanatorium for Indians only.

MODERN TENDENCIES IN PUBLIC HEALTH WORK*

ERNEST W. J. HAGUE
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THE BRANCHES of a modern city health department are numerous. There seems to be a disposition, however, at the present time on the part of some health officers to get rid of some of their problems by transferring them to other civic departments. This has been done in some instances and with success, as for instance:

Waterworks.—This is an engineering problem and it may be that the actual operation of such plants should be under the direction of some other department than the health department. But it is the health officer who is held responsible for the purity of the water supply of any community.

Sewerage.—In most cities the engineering department is responsible for the cleansing, repairing, and operation of the sewers, but the health department should always exercise a certain amount of supervision over the sanitary condition of the sewers, and especially over the character of their effluent. The health officer will be held largely responsible for the pollution of streams and lakes. If the system of sewage disposal is a menace to the community it is the health department which should point this out and suggest the remedy.

Scavenging.—In some cities the scavenging is done by some other department, but once the health officer allows this important work to be taken over by another department, the sanitary features of the work are apt to be neglected, unless the health department still exercises some control over the manner of storing, collecting, and disposing of garbage and other waste materials.

Medical Supervision of School Children.—Here again there are two schools of thought, one of which maintains that this work should be under the direction of the health officer, and the other that it should be conducted by the medical officer of the school board. There are good arguments in favor of either system. In actual practice, success depends on the way in which the work is done and some educational authorities are doing it very successfully. The health officer should always have the power, when circumstances demand it, to require changes and improvements in the methods employed. In any event, there should be close cooperation between the health officer and the medical officers employed by the board; otherwise the health department will be seriously handicapped in the effort to control communicable diseases.

There is a tendency, however, to go much further in curtailing the activities of health departments. In "The New Public Health," Dr. H. W. Hill gives a definition of public health as follows: "A term which includes all knowledge and all measures tending to (a) foster health, or (b) to prevent disease." Hygiene, he says, deals with the individual and his physical perfection; Sanitation with the causes and sources of those diseases which come from the outside—from the surroundings of the individual. He further subdivides sanitation into measures which (a) promote health, or (b) prevent dis-

* Presidential address to the Sanitary Inspector's Association of Canada, 11th Annual Convention held at Fort William, Ont., Sept. 3–5, 1924.

ease. Dr. Hill points out that a general cleanliness is not sufficient, but that we must have a specific cleanliness which actually eliminates disease germs; and more than that, a specific protection against each specific disease. The *old* public health he says concerned itself with environment. The *new* is concerned with the individual. The old, sought the sources of infectious diseases in the surroundings of man; the new finds them in man himself.

Some modern sanitary experts appear to adopt a rather narrow view of the work of a health department. It is urged that the principal work of a health officer at the present time should be the prevention of communicable disease; that we have not yet begun to control the more common communicable diseases, and that all efforts should be concentrated on this work alone.

Now concentration is all right if we know upon what to concentrate. Notable work has been done by this method. Most urban communities have so concentrated upon the purity of water supplies, proper sewerage, the installation of plumbing, the abolition of outside privies and surface wells, etc., that typhoid fever in these communities has been reduced to a minimum. By concentrating on rat extermination, the examination of rats, rat proofing, and the use of serum, bubonic plague has been stamped out in all communities where the coöperation of the inhabitants can be obtained. By cleanliness, and the destruction of body lice, typhus fever epidemics have been stayed. Yellow fever is almost extinct, and malaria and hookworm are being conquered by concentration on the known methods of dealing with these diseases.

It will be noted that most of the success in public health work in the past has been attained by improving the environment of man, and the supervision of the public routes of infection.

There does not seem to be, however, much reduction in either the case rates or the mortality rates of such common diseases as scarlet fever, measles, whooping cough, pneumonia, influenza, or diphtheria. In the case of diphtheria the use of the Schick test and toxin-antitoxin appears to indicate a method of concentration, which if applied will eventually eliminate this disease; but there do not appear to be any measures to hand which will deal effectively with the other diseases mentioned. Something may be done—in fact is being done—by a closer check on patients, contacts and carriers, but the public will only tolerate a reasonable amount of investigation and restriction.

After all, the great majority of people die from other causes than communicable diseases. The statistics for the Registration Area for 1922, with a population of 94,241,643, show only 3.1 per cent of all deaths are accounted for, as follows:

Diphtheria	1.2	per cent
Typhoid	.6	" "
Whooping Cough.	.5	" "
Measles	.4	" "
Scarlet Fever....	.3	" "
Smallpox	.1	" "
	3.1	" "

and 21.2 per cent:

Tuberculosis (all forms).....	8.2	per cent
Syphilis	1.4	" "
Malaria	.3	" "
Influenza and Pneumonia	11.3	" "
	21.2	

the total is only 24.3 per cent of all deaths.

It would not appear that there is much to be gained by abandoning other work now successfully carried out by health departments in order to concentrate on communicable diseases alone. Some of these other activities are milk and food inspection, child welfare work, housing, and general sanitation including the prevention of nuisances, the promotion of a general cleanliness, and the teaching of personal hygiene.

At the Boston meeting of the American Public Health Association, Dr. Charles

V. Chapin, Superintendent of Health, Providence, R. I., delivered a paper entitled "Nuisance Prevention a Hindrance to Disease Prevention."* In this paper Dr. Chapin takes a rather gloomy view of the effectiveness of present health activities, stating that all monies appropriated for the prevention of disease should be spent for that purpose alone, not on work which has an indirect or secondary effect upon the public health. He states that too much is spent on nuisance prevention, and too much time taken up by the health department on complaints regarding tin cans, ashes, spite fences, cockroaches, mice, vermin, etc., which have no important bearing on health. Dr. Chapin believes that ordinary nuisances could be attended to by the police. He admits that general municipal cleanliness promotes personal cleanliness, that preventing river pollution has averted epidemics, that the protection of the water supply, the extension of sewers and the abolition of privies are all worth while, but thinks that much of this work might better be done by the engineering department.

Unquestionably, Dr. Chapin is right in saying that many nuisance complaints are trivial, but on the other hand, many of them are well worth investigation, even some of the ones he lists as trivial. To speak of the police being required to do sanitary work in the abatement of nuisances is idle. They already have a multiplicity of laws to enforce and therefore have no time for investigating nuisances and finding who are responsible. Most cities never have enough men for police work proper. Additional patrolmen would be required, and they would have to be men with special training for the work of matters dealing with interior conditions in dwellings and other buildings.

In fact Dr. Chapin admits in his annual report for 1923 that "most of the patrolmen have not shown a great deal of enthusiasm" and it is further evident from the report that the Health Department was still obliged to do a good deal of nuisance inspection.

Is it to be implied that no efforts are to be made to improve housing conditions, or conditions in industrial plants? Of what avail is it to spend large sums on child welfare work and the supervision of school children if after saving the lives of these infants, they are to live in insanitary homes? The sick cannot all be hospitalized; surely their homes should be made and kept fit for occupation. Overcrowding must have some relation to health.

To hand over important work like this to some other department, or to neglect it altogether would be a grievous mistake. It takes inspectors of education and experience to deal with these matters effectively; and the man at the head of all these activities should be the health officer. He alone has the requisite training to properly organize and oversee the work. Building departments are concerned with details of safety and fire prevention, and not as a rule with sanitation.

If a health department possesses a division of sanitary inspection and housing, with an experienced sanitary inspector at the head, there is no reason for the health officer being bothered with unpleasant details, such as fighting with recalcitrant property owners. The health officer does the organizing and supervising. He stands ready to advise or instruct, but the hard field work must of necessity be done by the sanitary inspectors.

The principal reason, however, given by Dr. Chapin for handing over this work to some other department is on the ground of expense. Now if a certain fixed sum were allowed each year to a health officer to be allocated as he saw fit, there might be something in this argument. However, city councils have a habit of requiring itemized budgets, so that if the health officer decided to recommend that any branch of his work be transferred to some other department, he would simply lose the appropriation for that purpose. In any event, one thing is certain, the public will demand that some department shall be

* See *A. J. P. H.*, Jan., 1924, p. 1.

made responsible for abating or preventing nuisances, and enforcing the housing laws.

We plead, therefore, for a larger field of usefulness for health departments, instead of a more restricted sphere. Anything that may affect the health of citizens should come within its purview—anything that makes for cleanliness of person or surroundings, better housing conditions, better conditions in work places, right habits of living, diet, clothing, exercise, pure food, clean milk, smoke prevention, child welfare, as well as the most important work of trying to control communicable diseases. For all of these a health department should find time. Let us attack all along the line. The director in chief of all this work for health and longevity should be the man who has been specially trained for this purpose, viz.: the health officer. A modern, well equipped and well organized health department, paying attention to affairs perhaps of minor importance, as well as those of major importance, will be a power for good in the community, and will obtain the confidence and coöperation of the citizens.

I cannot close without expressing the hope that health officers as a class will recognize more fully the importance of employing trained health inspectors. A good deal is said nowadays about the necessity for improving the training of health officers, laboratory workers, sanitary engineers, and public health nurses; but nobody has apparently broached the subject of the proper training of sanitary inspectors. I am referring more particularly to the United States just now because in England the education and standing of these men is well looked after. It is rather surprising that the American Public Health Association has not apparently given any attention to this important matter.

A little work in this direction might bring surprising results in the keener interest displayed by sanitary inspectors in their duties, thus leading to more efficient work on the part of health departments in general.

Rickets as Influenced by the Diet of the Mother.—It would seem from the experiments conducted in this study that rickets cannot be prevented by improving the diet of the mother, (a) previous to pregnancy, (b) during pregnancy and (c) throughout lactation, although it can be mitigated to a certain degree. Supplementing the diet of the mother for two generations also failed to render the young refractory. Infants were not protected by giving the mother cod liver oil during the last two months of pregnancy. On the other hand, the fact that premature infants are markedly susceptible to rickets shows that prenatal nutrition does play a rôle. A consideration of the experimental evidence, of clinical tests, of the susceptibility of bottle-fed compared to breast-fed babies, and the striking seasonal incidence leads to the conclusion that rickets is mainly of postnatal origin. Although its incidence and severity may be influenced by improving the nutrition of the mother, our main efforts should be directed toward improving the environment and nutrition of the infant.—A. F. Hess and M. Weinstock, *Jour. A. M. A.*, 83:1558-1562 (Nov. 15), 1924.

Tuberculin Tests on Rural Children.—In a rural community, in which economic and hygienic conditions are unusually good, the percentage of children infected with tuberculosis is extremely low and suggests that, for the country as a whole, the figures cited are much too high.

In this community the percentage of positive reactors was not found to increase with advancing age. This circumstance may be due to the fact that many infections of early childhood have been relatively light and have thus not persisted and kept up the ability to react.

Under ordinary conditions every child in a home with a case of open tuberculosis becomes infected.—S. A. Slater, *Am. Rev. Tub.*, Nov., 1924.

A Request from Australia.—"Would you please forward me any posters or literature issued by your organization?" is a request from Dr. J. S. Purdy, Metropolitan Medical Officer of Health, Queen Victoria Building, Sydney, Australia.

MEDICAL AND NURSING SERVICE IN INDUSTRIAL PLANTS*

OSCAR DOWLING, M.D., Fellow A.P.H.A.
President, Louisiana State Board of Health

ALMOST from the beginning industrial enterprises utilized the skill of the engineer, the accuracy of the chemist, and the knowledge of all other specialists who could help in the development of their plants. The reward expected was an increase in productions or a better manufactured product, perhaps a cheaper and better one. Since this implied increased profit, the cost of the expert was considered a legitimate investment.

The effectiveness of the policy is shown in the industrial plants of the present day, many of which are so well equipped that even the machines seem gifted with human intelligence. In view of this enormous mechanical progress, it is inexplicable that industries have taken so long to appreciate the value of the human element in plant production. However, within the past few years investigations have brought out the significance of the health phase of industrial economy.

In this particular paper we are concerned only with medical and nursing service in industrial plants; it is a small part of the problem. The factor of the workers' environment when away from the plant is of the greatest importance. Overcrowded homes; poorly balanced, or it may be poorly prepared meals; perhaps presence of flies, fleas, lice, bed bugs; unhygienic habits; exposure to infectious diseases, are some of the health hazards which the medical supervisor of the plant cannot control. Something may be done by the nurse or social worker, but often it is only a temporary remedy and not a change in the conditions of the home.

However, as I see it, even in the improved work of our plants, we have not always stressed the essentials for excellent or satisfactory results in our industrial medical service. The more immediate, apparently the more important, demands are the ones to which the medical director must give his attention. Often he is burdened with innumerable duties which preclude his giving attention to the larger or more essential conditions. The physician is not always responsible; he is employed by the corporation, and unless he is master of the situation and can convince those in authority that he knows what is essential in plant environment, he may become a routine worker busy many hours a day, but not a factor in the prevention of illness and accident, which is really his function.

Belgium seems at present to lead in protection of the worker's health. All industrial or commercial industries must meet certain legal requirements; there is a minimum requirement of air for the workers in all of these, but if the occupation is especially unhealthful the minimum of air in these plants is doubled. Cleanliness and lighting of rooms, removal of wastes, provision for sanitary conveniences are similar to those in our own codes, but in Belgium there are many additional requirements. For example, the employes are forbidden to eat or bring food where there is any use of toxic materials, and the workmen are punished as well as employers for the transgression of any of the requirements. Period-

* Read before the Conference of State and Provincial Health Authorities, Lansing, Michigan, June 17, 1924.

ical compulsory physical examinations are required, and there are many special regulations pertaining to the length of the working day and the prohibition of work by women during certain periods.

In 1922 from June to December, 903 industrial firms in Belgium organized for sanitary protection of the workers. These industries employ 523 doctors who supervise the health of approximately 24,000 young people.

The medical department of a company in Alabama has 97 surgeons scattered throughout the state to care for the health and to look after the injuries of the employes of the company. One of their major activities is malaria control. This company is wise in providing recreational facilities in a number of places where there are large power plants.

There are physicians in the United States Public Health Service, in the Bureau of Mines and in various other departments of the federal government who make exhaustive studies of the working conditions which obtain in the industries of the United States.

The physician who would render the best service must insist that conditions shall be right and hygienic. Light, air, temperature, humidity and preventive epidemiological measures are fundamental.

It is the industrial physician's duty to determine in what manner the employes may be guarded against noxious fumes, improper postures at the work-bench, and conditions which endanger life and limb. He should endeavor to overcome the insidious influences of community life that very frequently exist in the crowded manufacturing districts. He can do much to protect and assist expectant mothers and their children, and can use his influence in preventing the exploitation of children below the legal age for employment. His greatest influence is undoubtedly with the employes themselves. If the company will allow him to use his knowledge by meeting the desires of the employes for needed recreation, he can do more toward bringing about conditions conducive to harmony and efficiency than can be accomplished by strikes and discords, so highly destructive both to the financial stability of the industry and to the welfare of the workers themselves.

In short, the physician can play an enormously important part in any large organization, if he cares to do so. His part is one which appeals to the human interests, and he will find his sphere of influence for good either great or small, depending upon the amount of tact, insight into human nature, professional ability and spirit of coöperation and understanding which he brings to bear.

The nurse in any industrial plant also is dependent on conditions for successful work, but not so responsible for their establishment as the physician. From the nature of the service rendered the nurse deals more specifically with the individual and the home.

In addition to the care of the sick or "near sick" required in the plant itself, I believe her chief duties are to visit the home and to give the physician information as to the wrong conditions which might be responsible for lessening the efficiency, physical vigor or mental poise of the employe.

It is understood that each industry has its own problems, and each must be served according to its needs.

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FEDERAL HEALTH REORGANIZATION

THE Sixty-eighth Congress which is now in the throes of its second and final session, has before it one bill which is of direct interest and great significance to sanitarians. This is a measure proposing a new department of education and relief, with a secretary in the Cabinet and assistant secretaries of education, public health, and veteran relief. As outlined in the Legislation Section of the JOURNAL this new department would take over the Bureau of Education, Federal Board for Vocational Education, United States Public Health Service, the Veterans' Bureau, Bureau of Pensions, and several other less important bureaus and offices. There are a number of important reasons why this plan is unscientific, unreasonable, and impractical from the public health standpoint. In the first place the Veterans' Bureau, always a political perplexity, would constitute about 90 per cent of the department, and with the Bureau of Pensions would completely overshadow both education and public health. In the second place, the last paragraph of this bill empowers the head of each executive department to make, subject to the approval of the President, such changes in the organization or allocation of bureaus as he considers desirable. In other words, under this drastic and dangerous provision, the Public Health Service could be merged in the Veterans' Bureau, or made an adjunct to it, completely or partially losing its identity. The third argument against this bill is that no consideration is given to any other federal health activity except the Public Health Service and St. Elizabeths Hospital for the Insane. There are a number of other bureaus, divisions, or sections in the federal executive departments which carry on major health activities, and any scientific plan should bring them in, or provide for some type of coördination between them.

As we go to press, the status of this bill is that there is a possibility that it may pass. This chance may be remote, but it is a real possibility. This measure ought not to pass, for it is thoroughly unsound. If there is effective opposition, expressed by sanitarians and others, the bill certainly will not be successful.

Studies of the present health activities of the federal government are now being made under the direction of an informal group of prominent individuals

interested in national health conservation. As a result of these intensive studies, a practical, scientific plan for coördination should be proposed. Such a scheme, properly conceived, so as to insure efficiency, economy, and effective correlation, besides being politically expedient, will be awaited with interest and eagerness by all who desire to see an improvement in federal health organization. In order to do justice to the importance of the subject it would undoubtedly be best if this plan did not have to be presented now as a substitute for the defective education and relief bill. It could better be presented during the Sixty-ninth Congress, which convenes next December. In the meantime, the proposed plan for a department of education and relief should be defeated or forced into abeyance by means of strenuous and well directed opposition, which may be communicated to senators and representatives in Congress.

SANOCRYSIN—A GOLD CURE FOR TUBERCULOSIS

ONE CANNOT but rejoice at the many attempts being made to combat tuberculosis. At the same time it behooves everyone to scrutinize each new treatment with great care. On the one hand, we have to guard against the cupidity of certain commercial men who seem to care more about selling a material than about the actual good which is done to the suffering sick; and on the other, we must be constantly on the alert to avoid being misled by the enthusiasm of honest workers whose zeal colors their claims with a degree of optimism not justified by facts. The history of the various cures for tuberculosis is a depressing one, filled as it is with cases illustrating both of the points just mentioned.

The latest cure which claims our attention has been brought forward by Professor Holger Moellgaard of Copenhagen, who for several years past has been investigating the action of certain salts of gold upon the tubercle bacillus. A preliminary account of his experimental work was given on October 28th before the Danish Medical Society. A solution of the gold salt is injected intravenously and intramuscularly. Its action on tuberculous animals and people is marked, and serious results occur, leading to death in some instances. As might be expected, the poisonous action is manifested chiefly on the kidney. The explanation given for this action is the germicidal effect of the gold on the tubercle bacillus, and the large amount of intracellular poisons which are liberated from the germ. In an attempt to avoid this action, Professor Madsen has produced an anti-serum in horses which when given apparently lessens the severe action of the gold salt.

Late in October, a meeting was held by the Medical Society of Copenhagen, at which the experimental work on cattle and other animals, and the clinical trials carried out on human beings in several institutions were discussed. The work has excited so much interest in Denmark and other countries, that physicians flocked to this meeting in such numbers that the hall could not hold them, and even after moving to a larger room at the Rigshospital, many of the audience remained standing from three to four hours on both days of the meeting. The claim was made by Professor Moellgaard that the gold salt is nontoxic for the tissues, although very toxic for the tubercle bacillus. No reaction follows intravenous injections, provided the tissues are healthy, but if tuberculosis is present, a violent reaction ensues, due, it is claimed, to the wholesale destruction of the tubercle bacillus with liberation of large amounts of poison. It is claimed that complete

cure has resulted in lower animals infected both naturally and experimentally, and even in advanced cases of the disease. A number of physicians connected with various hospitals gave their experience in the use of the cure. Reports indicate that human beings as well as animals will react to the gold salt after clinical recovery in the same manner as healthy animals which have never suffered from tuberculosis. Some tragedies were recorded, as well as brilliant successes. Those who reported cases of tuberculosis of the skin, iris, and surgical disease, were guarded in their statements concerning the value of the treatment.

It can be said of this alleged cure that it is being given to the public in a thoroughly professional manner. In England the Medical Research Council has been asked to investigate its value. In the United States it is to be tried out on animals in three separate institutions, and its clinical value is to be tested under expert control. The name "sanocrysin" has been given to the preparation, and the rights to its manufacture and sale for the entire world, exclusive of Europe, have been granted to an American biological house. The fact that an anti-serum is employed in the cure brings it under the supervision of the Hygienic Laboratory of the United States Public Health Service, and we can rest assured that no license will be granted for its manufacture and sale in the United States until its value has been thoroughly determined.

We do not wish to appear unduly pessimistic nor to pass judgment prematurely. The claims made for this new alleged cure are in some respects extravagant, and very probably the interpretation of the severe action on the kidneys given is incorrect. On the part of Professor Moellgaard, there is no doubt that his work is a serious attempt at chemotherapy, and it goes without saying that the production of the anti-serum by Professor Madsen is on a sound scientific basis. We will keep in touch with the experiments which are going on and our readers will be duly informed of the results. In the meantime, we can only advise watchful waiting and the cultivation of a frame of mind which will not leave us despondent if this alleged cure meets the fate of all of its predecessors.

MUNICIPAL HOUSING

AS LONG ago as 1851 Lord Shaftesbury secured from the British Parliament the passage of an act permitting the loan of public monies for the housing of the working classes. During the past quarter of a century all of the leading European nations have accepted a similar view of the responsibility of the state in regard to the housing problem. Holland built one dwelling for every 13 persons in its population during the years 1919–1922, Great Britain one for every 34, Belgium one for every 84, Italy one for every 184, France one for every 320.*

This important social question is discussed in a recent book,[1] which should be studied not only by the public health worker but by every intelligent and responsible citizen. As the author points out, "There is a widespread but fallacious view in the United States that European housing conditions are so much worse than ours as to make action necessary which would be uncalled for here. The reverse is true. We have housing conditions worse than any which now exist in London or Paris or Brussels or Amsterdam." She adds, "And I can assure my fellow-countrymen that I have nowhere seen houses even remotely comparable to the ten thousand old-law tenements of lower Manhattan, built before 1879, with their hundreds of

* In the case of the last three countries the situation is of course complicated by the restoration of the devastated regions.

thousands of inhabited rooms devoid of any opening to the outer air. Nor have I seen any surviving layout as bad as that of the North End of Boston, with its four- to seven-foot streets between five-story buildings and labyrinths of rear tenements filling the interior of its blocks."

Experience has amply demonstrated that the problem of model housing does not require subsidies (except during such crises as the post-war period in Europe) and that "on an at-cost basis everybody could be provided with a proper home." On the other hand, it is equally obvious that housing reform involves such large sums of money that it can only be carried out through a system of governmental loans, at usual moderate interest rates. These conclusions are essentially sound and they have been so generally accepted abroad that, as Mrs. Wood says, "In a few years the working people of western Europe will be living, rank and file, in such homes as only the fortunate minority can attain under our hit-or-miss system." This is one of the fields in which hide-bound conservatism is holding the United States far in the rear of modern progress.

[1] Housing Progress in Western Europe, Edith Elmer Wood.

THE JAPANESE EPIDEMIC

THE GREAT increase of communication with foreign countries, afforded by the various means of rapid transit, makes epidemic disease in any part of the world of direct importance to us in this country. The news of a severe epidemic in Japan of a disease which does not conform to any known character is, therefore, disquieting to us. This outbreak, which was first diagnosticated as cerebrospinal meningitis, later as encephalitis lethargica, is now said to show symptoms unlike either of these diseases.

It is a disease involving the central nervous system, with a mortality reaching 54.85 per cent, which is higher than is usually found in encephalitis lethargica and which approaches the rate seen in epidemic cerebrospinal meningitis. Generally, only one case occurred in a house, and affected only persons more than fifty years of age. The onset is sudden, with high temperature, and after one or two days, loss of consciousness occurs or slight maniacal symptoms are observed. Death occurs between the fifth and tenth day. The cerebrospinal fluid is clear and pressure not uniform. No pathogenic micro-organisms have been found. The first case occurred in July, and early in August the disease assumed an epidemic character. By the end of August the number of new cases had decreased considerably. Wassermann tests were negative both in the spinal fluid and the blood. The disease has been reproduced in rabbits and by injecting material under the dura mater, either filtered or unfiltered, the period of incubation being from two to three days.

The autopsy findings consist chiefly of congestion and edema of the meninges. There are no adhesions and no increase of the cerebrospinal fluid. There is general hyperemia of the cortex, but no other abnormality. In a few cases, petechial hemorrhages were seen in the floor of the fourth ventricle. Microscopic examination does not show any diagnostic changes. There are round cell infiltrations about the blood vessels, congestion in the cortex, and occasionally there are areas in the cortex, pons, and medulla of round cell infiltration.

It will be seen that up to the present time no definite diagnosis has been made. Six thousand five hundred and fifty-one cases were reported up to September 20

ASSOCIATION NEWS

STOMATOLOGY AND PUBLIC HEALTH

Sometime before the meeting of the Association in Detroit, a number of members organized themselves into an informal committee for the purpose of emphasizing the importance of mouth hygiene as a part of the public health program.

At the meeting this committee directed its activities primarily toward the establishment of a section on mouth hygiene in the American Public Health Association. The outcome was gratifying for the time being, and the efforts of the committee were successful in so far as it was possible to achieve, within the limits of the policy of the Association, regarding new sections.

The Mouth Hygiene Committee met on Sunday evening, October 19, at Detroit and planned to meet the members generally on Monday morning. This meeting took place, as planned, procedure was discussed and resolutions were drawn up.

The committee having finished this part of the business, the work of carrying out the details was then delegated to E. B. Hardisty, John L. Kelly, D.M.D., and Alfred Asgis, D.D.S.

The plan adopted by the committee was carried out in every detail. The mouth hygiene number of the *Review of Clinical Stomatology* (October, 1924) and an open letter addressed to the members of the American Public Health Association were mailed to every Fellow and member present. This enabled us to give additional information regarding the significance of stomatology to public health.

On Monday afternoon the sentiment of those members in favor of the establishment of a mouth hygiene section was evidenced from the many signatures which were placed on the petitions provided for that purpose.

On Tuesday morning, October 21, mouth hygiene was discussed in the Child Hygiene Section. A paper on "Dental Hygiene for the Child" was given by Dr. C. N. Johnson, President-elect of the American Dental Association, and the paper was discussed by Dr. William A. Giffen of Detroit, Michigan, President of the American Dental Association; Dr. Alfred Asgis of New York City, Secretary of the American Stomatological Association, and Dr. Charles Oakman of Detroit, Michigan. Mouth hygiene, as emphasized by the speakers was pointed out to be an integral part of public health work.

Dr. Giffen in his discussion expressed regret that so few dentists are members of the American Public Health Association. It is worthy of note that in the list of members of the Association published for July 1, 1924, only thirteen dentists were listed as members; these included the members of the Mouth Hygiene Committee. Dr. Giffen expressed the hope that great benefit would result from the endeavors of this committee which aims at the establishment of a means of coöperation between mouth hygiene and public health.

The committee was assured by both Dr. Johnson and Dr. Giffen of support on the part of the American Dental Association. The president of the A.D.A. presented the program of the Mouth Hygiene Committee at the Dallas meeting on November 11, 1924, and it is hoped that many dentists engaged in public health work will join us.

The discussion in the Child Hygiene Section favorably impressed those present and the *Daily Bulletin* of Tuesday, October 21, also aided greatly by carrying a notice of the proposal for a new section on mouth hygiene.

On Tuesday afternoon the petition with the endorsements of leading members of the American Public Health Association was presented to and discussed by the Governing Council, which was in session at the time. The Council after considering the resolutions referred the matter to the Executive Board for study and report.

Plans for a mouth hygiene program at the next annual meeting are in progress.

A campaign for membership will begin shortly, and we look for the support of all dentists active in public health work.

The Mouth Hygiene Committee for the com-

ing year consists of the following members:

Alfred Asgis, Sc.B., D.D.S., New York City, *Chairman*. Chief, Pyorrhea Clinic, Stomatology Dept. Midtown Hospital.

Elmer C. Chambers, D.D.S., Warren, Ohio.

Harold DeW. Cross, D.M.D., Boston, Mass. Director, Forsythe Dental Infirmary for Children.

Eudore Dubeau, L.D.S., D.D.S., Montreal, Canada. Dean, University of Montreal Dental School.

E. B. Hardisty, A.B., New York City. Statistician.

John L. Kelly, D.M.D., New York City. Associate, Pyorrhea Clinic, Stomatology Dept. Midtown Hospital.

Rea P. McGee, M.D., D.D.S., Pittsburg, Pa. Editor, *Oral Hygiene*.

Guy D. Millberry, D.D.S., Berkeley, California. Dean, University of California, Dental Dept.

Louis Ottofy, M.D., D.D.S., Chicago, Ill. "Standard Dental Dictionary."

Philip R. Thomas, D.D.S., Minneapolis, Minn.

Diego Meza, D.D.S., Mexico, D. F., Mexico. National University of Mexico.

So far, nine State Mouth Hygiene Units have been established to carry on local activities. Dentists active in public health work and interested in mouth hygiene are invited to join the Association. In order to keep those dentists informed and in touch with the activities of the Mouth Hygiene Committee of the American Public Health Association, they are advised to affiliate themselves with the Child Hygiene Section, until a mouth hygiene section has been organized and established. All dentists joining the American Public Health Association are requested to affiliate themselves with the Mouth Hygiene Committee.

For further information communicate with the Central office of the Mouth Hygiene Committee, Aeolian Hall, 33 West 42d Street, New York City.

ALFRED ASGIS, D.D.S.

OTTO ROBERT EICHEL

The sudden death of Dr. Otto R. Eichel, in Geneva, Switzerland, from pneumonia, came as a great shock to his host of friends in the United States. In the prime of life—only 41 years of age—and in the midst of active public health work, he was a strong man whom we could ill afford to lose. Best known perhaps as the Director of Vital Statistics of the New York State Department of Health for the past seven years, he still found time to spend himself in other lines of public service, and at the time of his death, on temporary leave from his position in Albany, he was just completing a ten-months' service with the League of Nations at Geneva, Switzerland, as Chief of the Service of Epidemiological Intelligence and Public Health Statistics.

Dr. Eichel, elected a Charter Fellow of the American Public Health Association, had for years been an active and earnest worker in the Vital Statistics Section, and at the last annual meeting of the Association at Detroit was elected Vice Chairman of the section. He was a member of the American Statistical Association and a Fellow of the Royal Statistical Society of England.

Dr. Eichel's work always bore the stamp of thoroughness, a fact which added not a little to his reputation, but aside from all this his friends will ever remember the genial, thoughtful, vigorous, and absolutely trustworthy man.

Dr. Otto Robert Eichel

The following Resolutions are to be submitted to the Vital Statistics Section at its next meeting:

WHEREAS, Dr. Otto Robert Eichel, Director of the Division of Vital Statistics of the New York State Department of Health, died on the morning of the twenty-fourth of Decem-

ber, nineteen twenty-four, at Geneva, Switzerland; and,

WHEREAS, Dr. Eichel for many years had been an active and earnest worker in the Vital Statistics Section of the American Public Health Association, and was at the time of his death vice-chairman of the Section;

Be It Resolved, That the Section express its profound appreciation of the life and service of Dr. Eichel and its realization that in his death it has lost a most faithful friend and competent worker; and be it further

Resolved, That the Section extend to his widow, Mabel Jacques Eichel, its deepest sympathy; and be it further

Resolved, That this action be inscribed on the minutes of the Section and that the secretary be instructed to send a copy of this resolution to Mrs. Eichel.

SCIENCE AND HEALTH

The members of any organization that publishes a membership list will receive from time to time many circulars. The members of the American Public Health Association have been receiving during the past few months several circular letters, to one of which the Association has given its approval. That one is the letter addressed by the American Association for the Advancement of Science. This Association calls attention to the fact that members of the American Public Health Association may, by virtue of our recent affiliation, join the A.A.A.S. without paying the customary entrance fee.

Public Health can hardly be designated as a science—it is rather a field of work in which all sciences are laid tribute for the good of the health of people. But few sanitarians are engaged in the pursuit of science as an end in itself; nearly all are occupied with the application of one or more sciences. Public health workers are applied scientists and as such must be ever on the alert to apply established scientific principles in new ways or to apply newly discovered facts to their old problems. This affiliation of the A.P.H.A. with the A.A.A.S. is therefore appropriate. Its greatest value to public health work will only be realized in such measure as the members of the A.P.H.A. affiliate themselves individually with the A.A.A.S.

MR. DINWIDDIE RESIGNS

In order to devote all of his time to the Commonwealth Fund child health demonstration program, Mr. Courtenay Dinwiddie has tendered his resignation as General Executive of the American Child Health Association, effective January 1, 1925.

It is stated that this new arrangement will make practically no change in the relations of the two organizations in the demonstrations and that Mr. Dinwiddie will be free to call upon the services of the staff members of the American Child Health Association in a reasonable degree for special services in connection with the demonstrations.

FRIENDS OF MEDICAL PROGRESS

Official action was recently taken by the Board of Directors of the Friends of Medical Progress to change the name of the Association to the American Association for Medical Progress. The old Boston headquarters has been transferred to 370 Seventh Avenue, New York City, where coöperation with the more important educational and health organizations will be facilitated. Mr. Benjamin C. Gruenberg has been appointed a Managing Director of the organization and will devote his full time to the work.

The organization has just completed the first year and a half of its growth. During this time it has furnished lecturers, held exhibits, and issued material on immunization and vivisection. This year the society is contemplating increasing the scope of its activities, and several branches are being planned. The American Public Health Association's Committee on Defense of Research coöperates with this organization.

LIST OF MEMBERS

Proposed for election to the A.P.H.A., December 1 to December 31, inclusive

B. B. Bagby, M.D., Richmond, Va., Medical Inspector.
Frederick E. Bolt, M.D. (Assoc.), Worcester, New York, Physician and Health Officer.
Mrs. Rozzie M. Carrow, Woodland, Calif., Public Health Nurse.
Wallace Crawford, M.D., D.P.H., Kiating Szechwan West China, Instructor in Public Health, West China Union University, Chengtu, Szechwan, West China.
Carl Rupp Doering, M.D., Sc.D., Boston, Mass., Instructor in Vital Statistics, Harvard Public Health School.
Andrew Colman Gaal, M.D. (Assoc.), Budapest, Hungary, Assistant in Hygiene, Institute of the Royal University of Budapest. Fellow of the International Health Board, Rockefeller Foundation. At present studying at Johns Hopkins University.
Oscar Haromos, M.D., Ironwood, Mich., Director Gogebic Public Health Lab., Grand View Hospital, Ironwood, Mich.
Joseph Patrick Kane, M.D., Walla Walla, Washington, County and City Health Officer.
Harold Brown Kenner, B.A., M.D.C.M., Stratford, Ont., Canada, Medical Officer of Health.
Frank H. Longenecher, B.S., Lewiston, Pa., Teacher of Public Health and Hygiene.
R. E. Luhn, Jr., Oklahoma City, Okla., Executitve Secretary, Tuberculosis Society, Oklahoma City, Okla.
Thomas McC. Mabon, B.S., M.D., Pittsburgh, Pa., Assistant Professor of Hygiene School of Medicine, University of Pittsburgh.
Thomas Wills Gibbs McKay, M.D., F.A.C.S., Oshawa, Canada, Medical Officer of Health, Oshawa, Canada.
Carl Puckett, M.D., State Capitol, Oklahoma City, Okla., State Health Commissioner.
Henry Crozier Ricks, M.D., Oklahoma City, Okla., Director of Laboratories, State of Oklahoma.
Elizabeth L. Smellie, R.N., Ottawa, Ont., Canada, Chief Superintendent Victorian Order of Nurses of Canada.
William Hay Taliaferro, B.S., Ph.D., Chicago, Ill., Associate Professor in Parasitology in Dept. of Hygiene and Bacteriology, University of Chicago.
J. L. Tresel, California, Pa., Health Officer, District No. 79, Washington County, Pa., Department of Health.

HONORARY FELLOWS

Henry R. Carter, M.D., The Rockefeller Foundation, 61 Broadway, New York.
Th. Madsen, M.D., Director State Serum Institute, Copenhagen, Denmark.

AFFILIATED SOCIETIES

Massachusetts Association of Boards of Health, Mansfield, Mass.
Virginia Public Health Association, Portsmouth, Va.

EMPLOYMENT BUREAU

HELP WANTED

Help wanted announcements will be carried free in this column until further notice. Copy goes to the printer on the 8th of each month. Mail to New York office as early as possible.

In answering keyed advertisements, please mail replies separately to office in New York City. In replying give age, professional training, salary requirement, previous positions held and three or more references.

Wanted: Laboratory man or technician by City Board of Health in a middle western state. State age, qualifications, etc. Salary $100 to $125 per month for capable man. Address 588, care of this JOURNAL, New York address.

NEW YORK STATE CIVIL SERVICE EXAMINATION

Director of Division of Venereal Diseases, State Department of Health. $5,000. Age limits 30 to 50 years. Candidates must be graduates of a recognized medical college; must have had at least 2 years of practice of medicine, one of which must have included skin and genito-urinary diseases; and must have had at least two years of experience in public health administration and venereal disease control. Open to nonresidents of New York State. Unwritten examination forms may not be accepted after February 14.

For application form, address a postal card to Examination Division, State Civil Service Commission, Albany, N. Y.

UNITED STATES CIVIL SERVICE EXAMINATION

(Full information and application blanks for these positions may be obtained from the U. S. Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. Civil Service examiners at the post office or customhouse in any city.)

Dietitian—To fill vacancies in Veterans' Bureau and Public Health Service. Entrance salaries $1,020.00 to $1,680.00 a year. Competitors not required to report for examination but will be rated on education, training and experience. Applications received until June 30, 1925.

Graduate Nurse and Graduate Nurse (Visiting Duty).—Applications received until June 30, 1925. Examinations to fill vacancies in the U. S. Veterans' Bureau and in the Indian and Public Health Services, at entrance salaries of from $1,020.00 to $1,680.00 a year. Applicants for the position of graduate nurse must have been graduated from a recognized school of nursing requiring a residence of at least two years in a hospital, and must show evidence of state registration. Applicants for graduate nurse (visiting duty) must meet requirements for graduate nurse

and in addition must have had at least four months' postgraduate training in public health or visiting nursing at a recognized school or one year's experience under supervision in public health or visiting nursing. Competitors are not required to report for examination but will be rated on education, experience, and training.

POSITION WANTED

Positions wanted announcements of 50 words or less will be carried for individuals at a charge of $2.00 per insertion. Copy should be received at the New York office by the 8th of the month preceding publication.

Pathologist.—Opportunity wanted by pathologist, theoretically and practically trained in tissue diagnosis, serology, hematology, blood chemistry and bacteriology; was director of base hospital laboratory; ten years' experience; willing to qualify by examinations if required; preferring outside teaching connection also; owning complete laboratory equipment; available fall 1925; any location; single, Protestant. Address 336 W. S., care this JOURNAL, New York address.

Wanted: Full or part time position as bacteriologist or milk inspector by M.D., 32 years old. Now bacteriologist for city of 50,000. Can do chemical analysis of milk, blood, alcohol, etc. New England States preferred. Address 340 S. E., care of this JOURNAL, New York address.

Public Health Administrator, M.D., C.P.H., with eight years' experience as a full time public health worker in departmental field. Municipal and private work. Permanent employment desired. Available on short notice. Full information and references furnished. Address 341 H. H., care of this JOURNAL, New York address.

Wanted: Industrial or public health position within commuting radius of New York City, by personable physician, aged thirty-three, licensed in New York and New Jersey. Minimum salary for full time $3,500.00. Part time considered. One year with Veterans' Bureau, and one year in present industrial position. Capable research worker. Good references. Address 342 E. S., care of this JOURNAL, New York address.

Position desired in public health or private laboratory, within commuting distance of New York, by young woman. Four years' experience in general laboratory technique. Can furnish references. Address 343 M. R., care of this JOURNAL, New York address.

BOOKS AND REPORTS

The Problem of Population.—*By Harold Cox, M.A., Editor of the Edinburgh Review. New York and London: G. P. Putnam's Sons,* 1923. Pp. 244. Price, $2.50.

The problem of population has engaged the attention of various classes of students. The biologists and eugenists have issued warnings and have taken a rather gloomy view of the outlook. While this subject has been more or less to the front for many years, the Great War seems to have brought it prominently forward, and during the past few years, a number of books on the subject have appeared. Those who believe that rule by the big stick is the proper method of controlling the world are alarmed over the prospect of not having enough cannon fodder.

"As arrows in the hand of a mighty man,
So are the children of youth.
Happy is the man that hath his quiver full of them:
They shall not be ashamed,
When they speak with their enemies in the gate."

Most of the clergy, and religious people generally, hold other points of view, but it is not too much to say that all thinking people are considering the problem. It is interesting to note that Malthus, who first specifically directed the attention of the modern world to the problem of population, and who was severely criticized for his views, is now hailed as a prophet who lived in advance of his time.

The book before us is a well-balanced exposition of the various points of view which may be taken of this most important subject. The chief consideration is the well-being of mankind, for on this depends not only our health and happiness, but the social progress of nations and the peace of the whole world. This is evident from the fact, which is generally acknowledged, that the necessity of food lies at the bottom of all wars. On the one hand, we have the attitude expressed by a number of German writers, that war is necessary to provide room for the growing population, and on the other, the declaration of religious men and social reformers that conditions must be improved so that the increase of population can be taken care of. There are so many different points of view that reconciliation of them seems practically impossible. It is interesting to note that a number of prominent church authorities are taking a decided stand on the matter. Up to the present time, the Roman Catholic Church has stood as adamant against any interference with nature, regarding each baby brought into the world as a soul to be saved for immortality. The protestant churches have followed more or less closely this doctrine of the Roman Catholic, though there is evidence of some revulsion of feeling on the part of some high in authority. In the chapter devoted to the ethics of the matter, the author discusses at length the biblical point of view, and quotes many passages on which the belief of the churches is founded. He points out the inconsistency noted between the doctrine and the practice of some of these bodies. For example, while the Roman Catholic Church goes further than any other in desiring that children be brought into the world, it demands a celibate clergy and supports many orders of celibate women as nuns, though the vows they take involve direct disobedience of the divine command to be fruitful and multiply.

The book discusses questions which cannot be settled offhand, but which demand careful study and which are coming to the front more and more insistently each year. It is written in an easy and interesting style. The statements of fact are taken from standard authorities. As a whole, it constitutes a fair presentation of the question both for and against, though it is perfectly evident that the author believes in regulation of the growth of population, even including birth control. The book can be heartily commended to all who are interested in the subject of which it treats.

M. P. RAVENEL, M.D.

The Children's Book of Food Verses.—*Winifred Stuart Gibbs. Boston: M. Barrows & Co.,* 1924. Pp. 68. Price, $1.25.

This book affords a delightful means of "painlessly" imparting to children much valuable information concerning food. The combination of good and clever verses with

dainty illustrations makes a strong appeal to children, and impresses upon their minds the sound facts presented. This book will be helpful to mothers and teachers in training children to right food habits. C. E. TURNER

Human Origins. **A Manual of Prehistory.**—*by George Grant MacCurdy. Volume I. The Old Stone Age and the Dawn of Man and His Arts.* xl+440 pp., 254 figs. in text. *Volume II. The New Stone Age and the Ages of Bronze and Iron.* xvi+516 pp., 410 figs. in text. *New York: D. Appleton and Company.* 1924. Price, $10.00.

The stage upon which the drama of man's emergence from the level of the beast was played has been reconstructed and the scenery changed since the last Glacial Epoch. The players left but few traces of their stage properties and no one remembers their lines. The reconstruction of the merest outline is the laborious task of the anthropologist and archaeologist. Dr. MacCurdy rebuilds a scheme of their progress in outline from their flints and potsherds and detects their growth of ideas and concepts in their decorative motifs, their industrial progress in their tools, their social awakening in their communal organization, and the dawn of religion in their ceremonial objects.

It is a fascinating story which the exploration of kitchen middens, the exploration of protected caves, and the excavation of undisturbed cave deposits and village sites has brought to light slowly and piecemeal, but with ever-increasing fullness and certainty. Dr. MacCurdy's book has the merit of both opportuneness and fullness. Exploration has advanced to such a stage in recent years in Europe that a coherent presentation of the prehistoric period of man's story may now be written. By personal inspection of many of the sites and much of the material recovered from them, he is able to organize a comprehensive account of many of the significant steps in the evolution of human culture.

The first volume deals with the Old Stone Age during which the glacial ice four times in succession pushed man back towards the tropics from the temperate regions of the Northern Hemisphere. During this period over twenty-five thousand years ago man not only progressed physically far above his simial ancestry, but acquired the arts of making tools from flints, bone and horn, and also developed an artistic skill in drawing of surpassing merit. This acquisition seems to have been wholly lost for a long time from among his successors, either because of replacement by inferior stocks or by less advanced cultures. What parts respectively war and disease played in this tragedy may never be known, but may well be imagined. As surely as brain capacity, and the art of chipping flint have played their parts in the drama, just as surely have plague, malaria, hookworm, and tuberculosis been on the stage periodically or continuously—and have deflected, impaired or otherwise hindered human progress. It is unfortunate that there is so little left to give even the slightest clue to the part that disease, epidemics, and debilitating endemic infections may have taken in the successions of human stocks and cultures and in their migrations and disappearances.

The second volume deals with the neolithic period in which man refined his methods of finishing his chipped flint arrow heads and axes, baked his clay utensils in the fire, ornamented them with geometrical designs, and even modelled clay figurines of the human form. The textile art arose in this period and developed into spinning, netting, knitting, weaving, and embroidery in flax and wool, and the weaving of baskets. The decorative arts emerged in the use of bone, ivory, shells, and amber in primitive jewelry, and the primitive sculptor carved conventionalized figures of woman in bas relief or in the round. Burial customs became more elaborate and the erection of giant monoliths became the fashion of the age.

It was in the Stone Age as a whole that primitive man made fire his servant, developed skill in the chase and in angling, devising weapons and snares for these ends, devised rafts and boats, learned to make and use the wheel, domesticated the dog, horse, ox, sheep, goat and pig, and utilized and perhaps cultivated many grains and fruits. He evidently had a code of ideas regarding human ailments and with his stone implements practiced a primitive but skillful bone surgery.

The author devotes less attention relatively to the ages of metals. He notes the origin of man's knowledge of metals from chance smeltings of native ores and alloys in the hearths and camp fires of primitive man, and recognizes the fact that copper was the first metal to come into general use because of its widespread occurrence and relative abundance in nature. However, he still adheres to

the use of the designation "bronze age" for the first of man's metallic ages. The metals added immensely to the range and uses of man's tools, increased his needs, tended to build up barter, commerce, and to increase travel. It was in this period that the medicine man added bronze razors to his collection of charms and amulets as an essential part of his professional equipment. It was in this period also that inhumation of the dead was superseded by cremation, much to the loss of the ethnologist. The perusal of this outline of man's development over a period of many thousands of years throughout the whole of which man's knowledge of disease was entirely empirical and his interpretation of it quite dominated by superstition and fear, leads to speculation as to the effect upon human evolution of our present scientific knowledge and control of nutrition, sanitation, child hygiene, control and prevention of epidemics, and of heredity.

Will the rate of evolution be speeded up or will it be deflected or counteracted by man's abuse of his knowledge? Is civilization a disease which ever and again temporarily checks human evolution and diverts its course into now one and now another human stock?

C. A. KOFOID, M.D.

Genetics and Eugenics.—*A text-book for students of biology and a reference book for animal and plant breeders. By W. E. Castle. Cambridge: Harvard University Press.* vii+434 pp., 155 figs. in text. 1924. Price, $2.00.

Outline for a Laboratory Course in Genetics.—*By W. E. Castle. Cambridge: Harvard University Press.* iv+33 pp. Price, 40 cents.

The value of the third edition of this well-known and widely used treatise has been enhanced by the insertion of six new chapters which deal with the biological basis of genetics, in which the reader is oriented with respect to the place of life in the universe, the cellular organization of plants and animals, the organization of chromatin which constitutes the material basis of heredity, asexual and sexual reproduction, parthenogenesis, the genesis of the sex cells, chromosomes and sex determination, and the relation of genetics to the evolution theory. There have also been added three chapters dealing respectively with the principles of plant breeding, the principles of live stock improvement, and the relations of Mendelian factors to mutations and to the evolutionary process. The author has also prepared a booklet of laboratory instructions for the guidance of classes or of individuals desiring to make experimental tests in the genetic field with fruit flies, Indian corn and mice. The theoretical formulas for various aspects of the Mendelian ratios and statistical tables for deviations and probable error are also included.

The lucid, logical, and comprehensive treatment of the subject and the sane, well-balanced discussion of controversial questions make this work one of the very best treatises on this timely subject, both for the student and for the general reader. The closing chapters on eugenics are notable for their candor and caution. After discussing the possibilities of race improvement by autocratic control of human breeding, the author sanely concludes that "we are limited to such eugenic measures as the individual will voluntarily take in the light of present knowledge of heredity. It will do no good, but only harm, to magnify such knowledge unduly, or to conceal its present limitations. We should extend such knowledge as rapidly as possible, but not legislate until we are very sure of our ground." An extensive bibliography of about one thousand titles and a well-organized index complete the work.

C. A. KOFOID, M.D.

Graded Outlines in Hygiene—

By Frank Cobb, M.D., B.P.E., Director of the Department of Hygiene, Baltimore, Md. Yonkers-On-Hudson, N. Y.: World Book Co., 1923. *Book I.* Pp. 214. Price, $1.36. *Book II.* Pp. 373. Price, $2.00.

Because of the scarcity of such books Book I should be of great value in aiding principals and the lower grade teachers to plan their hygiene programs. Cobb suggests that the object of the kindergarten work be to form health habits in the children more by example and by a discussion of the simpler health problems as they arise, than by following a definite program as in the higher grades. For the first half of the first year, he outlines a study of pet animals—their feeding, sleep, cleanliness, their hygiene of feet, eyes, ears, nose and throat, etc. For the second half of the first year he suggests a study of plants, birds, and insects. In the first half of the second year he outlines a discussion of child hygiene in other lands, and in the second half of the year he considers hygiene through

fiction and history, discussing Robinson Crusoe, fairy tales, and nursery rhymes. For the first term in the third year, a study of cleanliness may be made, discussing the hygiene of the face and hands, hair and nails, bathing, nose and throat, food, and drink, etc. For the latter half of the third year, Cobb suggests the presentation of daily hygiene problems, with a discussion of each of the activities performed during the day.

This book gives the teacher a certain amount of basic material upon which to work, and at the same time it offers many opportunities for initiative in varying the topics, and adapting them to the special conditions of her class.

Book II gives a complete summary of the work in hygiene for the fourth, fifth, and sixth school years. The lessons for each term are grouped about a central topic, one phase of which is considered each week. Two periods are devoted to formal discussion, but Dr. Cobb emphasizes the necessity of continual correlation with other subjects. In the fourth year the lessons concern the Enemies of the Body, such as germs, insects, stimulants, narcotics, poisons, malnutrition, recklessness, habit enemies, fear, worry and ignorance. This is followed in the second term by a consideration of the Defenses of the Body. Tactful avoidance of the more unpleasant phases of the subject makes it less objectionable.

In the fifth year the work becomes more technical, developed about the idea of the Motor Forces of the Body, and involving some study of structure. Approach is made through the treatment of the body as a highly efficient motor vehicle. This viewpoint is continued into the second term when the Hygiene of the Vital Forces is considered, including digestive processes, absorption, circulation, nutrition, respiration, excretion and elimination. The sixth year takes up the Special Senses and the Laboratories of the Body. The lessons of this last year are particularly full of practical information from the standpoint of personal hygiene.

Each lesson is outlined in detail with suggestions for developing ideas, material for illustrating, devices for motivating, and methods for enlisting the coöperation of the home, or for sending information into the home as the case may be. The positive side of health teaching is repeatedly emphasized. The author appreciates that the best health teaching is developed in well organized and supervised school systems where teachers are encouraged to put their own initiative and personality into the development of health training. These books are valuable teacher aids in such a program. C. E. TURNER

Heredity and Eugenics.— *By R. Ruggles Gates. New York: The Macmillan Company.* xiv+288 pp., 35 figs. in text. 1924. Price, $4.80.

The author, who is professor of botany in the University of London, has the advantage of a familiarity with the facts of heredity in both plants and animals and of the investigator's contact with the cytological basis of genetics. His work is a critical summary of the facts of inheritance in man, and the inferences drawn from them by various investigators who have dealt with them. He inclines to Castle's view that size, in animals at least if not in plants, is a general quality rather than the resultant of independent size factors in the several parts of the body. The rapid decrease in size of horses and of turkeys when returned to a feral life on isolated islands, and the rapid increase in size of other organisms under culture or in domestication is as yet without genetic explanation.

Contrary to the conclusion of Holmes that feeble-mindedness in man is not a pure recessive, but rather a complex of characters often simulating graded dominance, our author treats this defect as a simple recessive. The inheritance of abnormalities and malformations of the digits is extensively discussed. Congenital deafness is regarded as a simple recessive, and myoclonus epilepsy as a homogeneous recessive. Hereditary nosebleed is not sex-linked as are hemophilia, Gower's disease, and color-blindness. Alkaptonuria and albinism are recessive, as probably are also cataract, though this has been interpreted as a dominant. There are records which indicate its *de novo* origin. Night-blindness according to recent investigations is inherited like color-blindness as a sex-linked character, being transmitted through unaffected daughters to some of their sons. In one instance color-blindness has been female sex-linked, being dominant and inherited from mother to daughter alone for five generations. Many abnormalities in structure and function exhibit evidences of inheritance, as for example, diabetes insipidus, which behaves as a Mendelian dominant, while the asthmatic tendency is recessive. The parent-offspring correlation

in tuberculosis is such as to indicate a hereditary tendency. The comparison of this correlation with that of husband and wife may, however, introduce an error resulting from the greater susceptibility of children as compared with adults. There is a little evidence in pure populations of marked differences in the tendency to cancer in different strains and races of men, and much clearer evidence of the hereditary transmission of the tendency to cancer among some animals.

The discussion of the inheritance of mental traits is less complete. The eugenic program includes positive selection for desirable qualities and negative against undesirable ones, the isolation of individuals with undesirable dominant qualities, and the fostering of matings of those with desirable but recessive qualities. All this implies more knowledge than is now available for most human stocks. Education and general interest may in time make parts of this program possible. An intelligent and enlightened public opinion will be more efficacious than legal action.

C. A. KOFOID, M.D.

Organic Adaptation to Environment.—*Edited by Malcolm R. Thorpe. New Haven: Yale University Press.* xvii+312 pp., 34 figs. in text. 1924. Price, $4.00.

This is a symposium presented by eight specialists in various biological fields before the Palaeontology Club of Yale University in 1922–1923 on the subject of the adaptation of living things to their surroundings. The factors which constitute an environment especially of the plant are defined by Professor G. E. Nichols. The measurable aspects of this environment which may be designated as climatic, physiographic, biotic, anthropopoeic, pyric, mechanical, chemical, and also as conditions of light, temperature, and moisture interact each upon all the others and thus form nature's tool for modifying the individual organism. These reaction variations induced at once in the individual lowland plant grown under alpine conditions correspond to the adaptations of alpine plants which have become hereditary. The present trend in genetics is to maintain that such environmental responses cannot become heritable and the experimental evidence is conflicting.

Perhaps one-half of all animal species are parasitic at some stage of their life cycle. These animals live as a rule in an environment of great constancy and exhibit adaptations both chemical, such as antibodies, and structural, such as the loss or reduction of organ systems and high specializations of certain parts such as the reproductive system. The final chapter by Professor Ellsworth Huntington is a summary of the relations of human racial evolution to the configuration of the land masses and to climatic conditions such as rainfall and aridity. Of especial interest is his discussion of the climatic factors in the glacial periods and their probable relations to the evolution of the human species.

It is significant of the limitations of the biological trends of today that no suggestion of disease as a part of the general environment of organisms appears in this symposium. It may well be that disease through its biochemical aspects has much to contribute to the solution of the real causes of adaptation. Perhaps the most effective factors in the "environment" having their most intimate contact with the organism and with its germ plasm are to be found in these instances of parasitic invasions. A survey of the changes in structure of both host and parasite induced by parasitism is suggestive of an unusual potency of the biological interrelations established by contacts of host and parasite.

C. A. KOFOID, M.D.

Twenty-seventh Annual Report of American Bakers Association.—Public health workers will perhaps identify the American Institute of Baking by the gift it received of a portrait bust in bronze of Louis Pasteur. The bust is not only a contribution to American art, but dignifies the Institute in such a way as to command recognition from the scientific world.

The Association has for its main purpose the development of the baking industry. This is being accomplished through various channels, such as: laboratory research, economic research, schools of baking, and various committees delegated to study certain economic aspects that have a bearing on the industry.

To those interested in food and its application to the dietary, several sections of the report will be of interest. The scientific and technical work carried on in the laboratories of the American Institute of Baking has embraced a rather extensive field of investigation and study. Various cereal foods have been examined with a view of determining nutritive value and vitamin content, such as: Nutrex Bread, Vitamix and Vitovim Bread.

The work of the Food Research Institute falls into three divisions: chemical, statistical and economic. In the chemical division Dr. C. L. Alsberg is directing work in the analysis of wheat flour, and particularly the wheat starches. In collaboration with O. S. Rask, two papers have appeared: "A Viscosimetric Study of Wheat Starches," *Cereal Chem.*, January, 1924, pp. 7–26, and "On the Gelatinization by Heat of Wheat and Maize Starch," *Cereal Chem.*, May, 1924, pp. 107–115.

An interesting list of 100 technical questions received by the Association for answer during its past fiscal year is included in the report. Among them such questions are asked as: "What is the relative comparison of calories in a loaf of bread with other foods?" "What bread ration could be advocated and recommended from a sound economic and nutritional standpoint?" "Kindly send us information in regards to obesity bread." Surely this indicates a need for knowledge of nutrition and its application to health.

HEALTH DEPARTMENT REPORTS

Colombo, **Ceylon, India.**—Dr. C. V. Aserappa, the Acting Medical Officer of Health of Colombo, presents his first annual report for the city for the year 1923.

If the health of a city may be gauged by mortality rates, conditions in Colombo are not satisfactory. The population of the municipality according to the census population of 1921 was 250,433. There were 8,893 deaths registered in 1923, representing a crude death rate of 35.5 as against 31.1 per 1,000 in the preceding year and 29.8 for the preceding ten years. Exclusive of non-resident deaths, the rate was 31.1 per 1,000. However, the rates for 1923 are perhaps a bit high as there has been an increase in population since 1921 which cannot be accurately estimated.

Adverse climatic conditions during the year under review were perhaps responsible for some increase in the death rate. However, the average death rates from pneumonia, phthisis, enteric fever and deaths of early infancy are still very high. The high death rates are attributed to bad housing conditions, poor drainage, inadequate sewage disposal methods, and poverty.

There were 7,107 living births in 1923, and 1,929 deaths under one year of age, giving an infant mortality rate of 271. This rate does not compare favorably with one of 254 for the preceding ten years. The most important factors in this high rate are extreme poverty and poor housing conditions.

The Public Health Department has been seriously handicapped by inadequate personnel. Recently an additional assistant has been furnished the city, but more workers are needed to adequately cope with health conditions in Colombo.

British Columbia.—The twenty-eighth report of the British Columbia Provincial Board of Health is a concise résumé of departmental activities during the year ended June 30, 1924. The Health Officer, Dr. H. E. Young, has assumed a very definite, positive tone that stresses prevention and the building up of positive health.

Prenatal, preschool, and eye and ear clinics are being organized. This is an extension of the infant welfare work already conducted. A Crippled Children's Fund has also been established, and during the past year thirty crippled children have been cured.

The death rate (exclusive of still born) for the year under review was 8.71, and the infant mortality rate 67.4. The latter is 4.24 points higher than the previous year. "Should, however, the births of children born alive during the year 1923, but whose births were registered during the first six months of 1924, be included, then the rate per 1,000 of living births would be 60.7." This is an admission of tardy reporting of births.

A report of the medical inspection of schools is included in the report. This work has produced definite results. A summarized table of the defects found would perhaps be easier for the reader to follow than the listing of each defect for each school.

Madras, India.—Of all the health activities in the City of Madras, India, reported for the year 1923, the most interesting one is that of child welfare. The most important event under this division was the first child welfare and baby show held under the auspices of the Corporation. Various prizes were awarded to the winners in the baby show, the success of the project being

evidenced by the large number of entrants and the eagerness of the mothers to learn how to rear healthy, happy babies. "The change in the mothers' feelings from superstitious fear which dreaded a baby being weighed to one of genuine satisfaction and pleasure in handing over their babies with more than a hope of winning prizes, was marked indeed." This is encouraging to the workers who have striven for almost six years to create a desire on the part of the parents to have healthy children.

The efficacy of the work may be judged in part by a comparison of the infant mortality rate of 201.9 for the child welfare scheme as against a rate of 254.0 for the whole city for the year under review. Moreover, the work has grown enormously since 1918, the number of cases conducted being 5,820 in 1923 as against 550 in 1918. The only handicap in enlarging the scope of the work is in lack of funds.

The report is well presented and it is unusual to find a report from a foreign country which is so well illustrated.

New Bedford, Mass.—The crude death rate of 11.6 for New Bedford, Massachusetts, in 1923 was the lowest in the history of that city. Deducting non-resident deaths, a corrected death rate of 11.02 per 1,000 inhabitants is given. The leading causes of death during the year were bronchopneumonia, heart disease, cancer and cerebral hemorrhage. Only 95 deaths occurred from pulmonary tuberculosis, the smallest number in the city's history.

In 1922 New Bedford was one of the three cities in the United States that had no typhoid fever deaths. In the following year five cases of the disease were reported, with one death. The low incidence of typhoid fever is attributed to a good water supply and the use of typhoid vaccine as a prophylactic.

Only one case of smallpox was reported during the fiscal year. When we are told that 1923 was the banner vaccination year for the city the reason for the low incidence of smallpox becomes quite obvious.

Dr. C.-E. A. Winslow of Yale University made a health survey in the city during August, 1923, the major portion of his report being devoted to the municipal health department's activities. It is the opinion of the Board of Health that the most important single measure proposed was that of the pasteurization of milk offered for sale in the local market, with the exception of milk that is of certified grade. After careful consideration, it was decided that after January 1, 1925, the city would require milk dealers to pasteurize milk, adding to its force an additional full time milk inspector together with an assistant to help on dairy farm inspections. Some of Dr. Winslow's recommendations cannot be carried out because of financial difficulties. However, the board feels that his report is valuable since it gives a bird's eye view of what the community needs in order to produce positive health.

New Bedford's 1924 report promises to reflect even a more optimistic tone than does the one for the preceding year. The crude death rate of 9.8 and the infant mortality rate of 78 are the lowest in the history of the city, the latter being 15 points lower than the previous lowest rate of 93.99 for 1921. The New Bedford *Standard* has a right to claim that "Public health work here is conducted on an effective basis, and the municipal health department has something worth while to show for the money expended."

Los Angeles, Calif.—After a perusal of the report of the Los Angeles Department of Health for the year ending June 30, 1924, anyone interested in preventive medicine is inclined to sympathize with the difficulties of the city's health commissioner, the late Dr. L. M. Powers. With inadequate and insanitary quarters for the several clinics; unrest and discord existing in the departments where help is insufficient and salaries periodically disturbed, which tends to result in inefficiency, it is not surprising that a plea is made to the mayor and council for a survey of the needs and workings of the Los Angeles Health Department.

The communicable disease report bears out the above. Tuberculosis, chicken pox, typhoid fever, diphtheria, measles, scarlet fever, poliomyelitis, and smallpox showed a marked increase over the preceding year, the latter especially. There were 3,442 cases of smallpox reported, which brings forth a statement from Dr. Powers that "the City of Los Angeles has demonstrated to any intelligent person the necessity of a compulsory vaccination law."

The laws of the city are such that the school inspection is under the Board of Education. This does not provide for inspection

of communicable diseases, the Health Department being permitted to inspect schools only *after* a disease appears in the schools. Obviously, this is a distinct handicap, for the Health Department cannot foresee or prevent outbreaks of communicable diseases under such a ruling.

The report is not altogether pessimistic. Although the various departments have been considerably handicapped, some progress may be noted. For example: better work and more definite results have been obtained in the tuberculosis clinics during the past year; the various food divisions have accomplished a good deal in spite of the fact that dairy inspection and tuberculin testing of cattle were abandoned because of the outbreak of foot and mouth disease among cattle in California; and the Division of Housing and Sanitation has done valuable work.

BOOKS RECEIVED

Books received during December are listed here. Many of these will later be reviewed.

RACIAL REALITIES IN EUROPE. By Lothrop Stoddard. New York: Scribner, 1924. Pp. 252. Price, $5.00.

THE CHARACTER OF RACES, THEIR FORMATION AND MODIFICATION BY ENVIRONMENT. By Ellsworth Huntington. New York: Scribner, 1924. Pp. 393. Price, $5.00.

A REFERENCE HANDBOOK FOR NURSES. By Amanda K. Beck, R.N. Philadelphia: Saunders. Pp. 288. Price, $1.50.

CONCEALED TUBERCULOSIS. (The Tired Sickness.) By Geo. Douglas Head, B.S., M.D. Philadelphia: Blakiston. Pp. 135. Price, $2.00.

POPULATION AND THE SOCIAL PROBLEM. By J. Swinburne, F.R.S. New York: Macmillan. Pp. 377. Price, $5.00.

INTERNATIO..AL YEAR BOOK OF CHILD CARE AND PROTECTION. Compiled by Edward Fuller, Editor of "The World's Children." New York: Longmans, Green & Co., 1924. Pp. 448.

THE EDUCATION OF HANDICAPPED CHILDREN. By J. E. Wallace Wallin, Ph.D. Cambridge, Mass.: Houghton Mifflin Co., 1924. Pp. XIV+394. Price, $2.25.

SAFEGUARDING CHILDREN'S NERVES. By James J. Walsh, M.D., and John A. Foote, M.D. Handbook of Mental Health. Foreword by Herbert Hoover. Philadelphia: Lippincott, 1924. Pp. 272. Price, $2.00.

CIVILIZATION AND CLIMATE. By Ellsworth Huntington. New Haven: Yale Univ., 1924. Pp. 453. Price, $5.00.

FOOD FACTS FOR EVERY DAY. By Florence E. Winchell. Philadelphia: Lippincott, 1924. Pp. 107. Price, 86 cents.

LEAVES FROM THE GOLDEN BOUGH. By Lady Frazer. New York: Macmillan, 1924. Pp. 233. Price, $3.00.

A LABORATORY MANUAL OF THE ANATOMY OF THE RAT. By Harrison R. Hunt, Ph.D. New York: Macmillan, 1924. Pp. 123. Price, 90 cents.

HEALTH AND CLEANLINESS. Rev. Ed. O'Shea & Kellogg. New York: Macmillan, 1924. Pp. 279. Price, 80 cents.

PROTEINS AND THE THEORY OF COLLOIDAL BEHAVIOR. By Jacques Loeb, 2nd ed. New York: McGraw-Hill Co., 1924. Pp. 380. Price, $3.50.

REPORT OF THE SCIENTIFIC RESEARCHES ON THE VENEREAL DISEASES. Prepared by Dr. Edward L. Keyes, American Social Hygiene Assn., New York.

PROCEEDINGS OF THE ELEVENTH ANNUAL MEETING OF THE NATIONAL FRATERNAL CONGRESS OF AMERICA HELD IN WASHINGTON, Aug. 25–29, 1924.

THE CARE, CURE AND EDUCATION OF THE CRIPPLED CHILD. By Henry Edward Abt. International Society for Crippled Children, Elyria, O. Pp. 210. Price, $3.50.

Books on public health and allied topics can be conveniently purchased through the Book Service of the American Public Health Association, 370 Seventh Avenue, New York City.

PUBLIC HEALTH NOTES

GENERAL

Interesting Publication Changes.—It is doubtless a sign of vitality that there are continual changes in public health organizations and publications. The Red Cross and the American Child Health Association have both announced important changes in their periodicals.

With the January issue, the *Child Health Magazine* will be discontinued. Health workers will miss this attractive periodical which has had a brief but brilliant career. Beginning in June, 1920, as a publication of the American Child Hygiene Association with the title "Mother and Child," it quickly took its place with other health periodicals and met what was an obvious need. Under the capable direction of Ellen C. Babbitt the news of maternal and child hygiene work here and abroad was welcomed each month by thousands of readers. When the American Child Hygiene Association merged with the Child Health Organization to form the new American Child Health Association, "Mother and Child" came under the supervision of Arthur Tomalin, Director of Publications of the new society. He brought to it the experience of years of service in the commercial magazine field. The magazine was radically changed in appearance so that it became at once in form as well as in content one of the outstanding health periodicals, in physical appearance perhaps the most attractive of all. It was rechristened the "Child Health Magazine" in January, 1924, and Miss Babbitt became its editor.

It is with regret that we note the discontinuance of this magazine after twelve months of useful service. The official announcement made by the A.C.H.A. says:

"The Association will be able to increase greatly its distribution of information on child health through popular magazines, professional, class and trade journals and the press. Therefore the Child Health Magazine will be replaced by a bulletin containing information on special subjects, which will be published from time to time, as occasion demands, and which will be made the basis of press releases for wide distribution."

The *Red Cross Courier*, which has been published weekly since January 7, 1922, and which was preceded by the *Red Cross Bulletin*, was changed with the issue of January 1, 1925, to a semi-monthly publication. The Red Cross announces a new publication for high school students, entitled "The High School Review." These two magazines, together with the *Junior News*, provide material for primary, secondary and adult use.

Death of Dr. A. R. Warner.—Dr. A. R. Warner, Executive Secretary of the American Hospital Association, died suddenly at his home in Deerfield, Illinois, November 27, from heart disease.

Dr. Warner was born in Pulaski, New York, in 1875. He was graduated from Hamilton College in 1899 and from Western Reserve University Medical School in 1906. Subsequent to graduation, he practiced medicine at Cleveland, Ohio, for a few years. The first hospital position Dr. Warner held was that of assistant superintendent of Lakeside Hospital, Cleveland, Ohio. In 1913 he became its superintendent, a position he held until his appointment as Executive Secretary of the American Hospital Association, October 10, 1919.

Dr. Warner was very active in the development of organized hospital activities. He was one of the founders of the Cleveland Hospital Council and of the Ohio Hospital Association and served as president of the Ohio Hospital Association in 1918 and 1919. He was also instrumental in developing and organizing the American Conference on Hospital Service and served continuously as vice-president of the Conference from the time of its organization. Dr. Warner was a Fellow of the American Medical Association.

From the beginning of his hospital career he was actively interested in the work of the American Hospital Association, serving on several of its important committees. In 1918 he was elected its president. His earnestness and enthusiasm in the organization of hospital activities won for him not only nation-wide, but international, recognition.

STATE

MICHIGAN

Fourth Annual Conference of Health Officers and Public Health Nurses.—Under the auspices of the Michigan Department of Health and the Michigan Public Health Association, the Fourth Annual Conference of Health Officers and Public Health Nurses was held in Lansing, Michigan, December 10 to 12. The conference was unusually successful from the viewpoint of attendance, over two hundred health officers and nurses being present, representing practically every section in the state.

An outstanding feature was a Conference of Water Purification and Sewage Disposal Plant Operators that was called for the discussion of the various problems relating to the operation of sewage disposal and water purification plants.

All Michigan Women's Clubs were invited to send representatives to the conference this year, and the response to the invitation showed that the official public health workers are not alone in their interest in public health.

Papers and addresses were given by Dr. Florence L. McKay, Director, Division of Maternity, Infancy, and Child Hygiene, New York State Department of Health, Dr. Harry L. Rockwood, Commissioner of Health, Cleveland, Ohio, Dr. S. J. Crumbine, American Child Health Association, Dr. Robert Lockhart, District Health Commissioner of Cuyahoga County, Ohio, Dr. Leslie L. Lumsden, United States Public Health Service, Dr. Benjamin White, Director, Division of Biologic Laboratories of the Massachusetts Department of Health, and Abel Wolman, Chief Engineer of the Maryland Department of Health.

A great deal of interest was shown in Dr. White's talk on "Some Aspects of Scarlet Fever," in which he urged that the use of the Dick test and scarlet fever toxin be delayed until thoroughly investigated.

The Public Health Administration Forum was one of the most satisfactory features in which nurses and health officers met for informal discussion of their problems.

The first day of the conference was spent in reviewing the work of the State Department of Health, at which time demonstrations were given in all the bureaus.

NEW JERSEY

New Jersey Sanitary Association.—The Fiftieth Anniversary Jubilee Meeting of the New Jersey State Sanitary Association was held in Haddon Hall, Atlantic City, December 5 and 6, 1924. On account of the illness of Congressman-elect T. Frank Appleby, who has since passed away, it was necessary for Charles W. Crankshaw, M.D., of Newark, First Vice-President, to serve as presiding officer at the meeting.

Interesting exhibits which were shown in connection with the meeting attracted considerable attention.

Papers were delivered by the following: W. S. Rankin, M.D., Hon. Edward L. Katzenbach, Lieut. Col. Edward B. Vedder, Dr. B. J. Lloyd, H. T. Critchlow, James E. Brooks, M.E., Charles Thom, Joseph M. Thompson, W. T. Blackwell, and William H. Park, M.D.

Officers were chosen for the coming year as follows: President, Charles W. Crankshaw, M.D., Newark; First Vice-President, Louis J. Richards, Elizabeth; Second Vice-President, Chester G. Wigley, C.E., Maplewood; Third Vice-President, B. S. Pollak, M.D., Secaucus; Secretary, Edward Guion, M.D., Atlantic City; Treasurer, Herbert B. Baldwin, Newark; Chairman of Executive Council, B. H. Obert, Asbury Park; Honorary Fellows, Thomas W. Harvey, M.D., Orange; H. H. Davis, M.D., Camden.

A business meeting of the Health Officers Association of New Jersey, the President, Dr. Joseph C. Saile of Bloomfield, presiding, was held in connection with the meeting of the New Jersey Sanitary Association.

LABORATORY

C. C. YOUNG *

A Method of Demonstrating Tubercle Bacilli in the Urine.—The technic is as follows: The urine is obtained by catheter from the bladder or kidney. A tube of urine is centrifugated at lowest speed for two to three minutes, thereby removing the bulk of the pus and detritus. The supernatant cloudy fluid, containing a few pus cells and bacilli, is poured off, one-half is discarded and the remaining half is poured into a second centrifuge tube. To this half filled tube, one-quarter volume of 95 per cent alcohol is added, the remaining quarter being distilled water. The mixture is centrifugated at highest speed for forty-five minutes until clear, the supernatant fluid discarded, and a smear made from the sediment obtained with a flamed wire loop. The smear is allowed to dry and is then fixed by being passed rapidly two or three times through a Bunsen flame. The centrifuge must be an electrically driven high speed machine. The Ziehl-Neelson stain is employed. The preparation is decolorized by exposure to 30 per cent nitric acid, followed by alcohol (Czapewski's solution), or to 20 per cent sulphuric acid. The pitfall is that occasionally nitric acid and alcohol may not decolorize all acid-fast bacilli other than tubercle bacilli. Twenty per cent sulphuric acid will decolorize all other acid-fast bacilli, but may also decolorize tubercle bacilli. The decolorized smear is washed with water, and counter-stained with methylene blue. The dangers of error in diagnosis are the same as with other methods of staining tubercle bacilli in the urine. The smegma bacillus is the chief offender of the acid-fast group of organisms. Centrifuge tubes may be cleaned by any method that will insure against the presence of acid-fast organisms. Treatment with acid, distilled water and alcohol, and drying with ether, may be employed.—Stephen C. Jones, *Jour. A. M. A.*, 83:1917 (Dec. 13), 1924. O. M. M.

Pure Culture of B. Influenzae from Pelvic Abscess.—From the bacteriological standpoint this case is of interest owing to the unusual finding of B.influenzæ in pure culture of pus from a pelvic abscess. The original source of the infection and the route of invasion of the pelvis are matters subject only to speculation, since none of the possible explanations can be proved. No primary focus of infection in the patient, such as a pulmonary condition (recent influenza, bronchitis, etc.), or accessory nasal sinus involvement, could be found. There were no gastrointestinal disturbances, other than the three attacks during the last seven to eight months which might indicate a mild appendix involvement. Unfortunately the appendix after removal at operation was not sent to the Bacteriological Laboratory for cultural examinations; therefore the question of whether it showed the presence of B.influenzæ cannot be answered. Presuming that the influenza bacillus was present and had broken through the wall of the appendix, a mixed infection with intestinal types of organisms might have been expected. Another possible route of invasion to the peritoneum might occur through the vagina, uterus and tubes, although the history offered no evidence of any infection of the genito-urinary tract. Among other sources of infection the blood stream or the lymphatic system might possibly carry the organisms from a focus such as the tonsils, or from the urinary tract, and deposit it in the region where found. The question whether the infection in the pelvis was primary or secondary to some other focus in the body still remains open. If the latter, perhaps the appendix should be given first consideration.—Paul C. Morton and L. W. Famulener, *Proc. New York Path. Soc.*, 22:6–8 (Oct.-Dec.), 1922. Authors' Comment.

Autogenous Vaccines in Diagnosis with Special Reference to Asthma.—The authors are using a skin test as a means to aid in the diagnosis of asthma. They eliminate airborne and food proteins as etiologic factors

* Each month we desire to publish in the LABORATORY NOTES two or three short articles (not exceeding 250 words) dealing with some phase of applied bacteriology, labor saving devices, modified methods, etc. Please address all material to C. C. Young, State Department of Health, Lansing, Mich.

whenever possible. For the clinical examination of the patient all possible foci of infection are looked for and an exacting bacteriologic examination of materials from these sources is made. A separate vaccine is made from each organism found. The standardization of the vaccine is based on the method published by J. G. Hopkins in *Journal American Medical Association*, 60:1615, May 24, 1923. In making the skin test 0.01 c.c. of vaccine is used. The control consists of the same dilutent of sodium chloride and tricresol solution. Two positive reactions are read—(1) an early positive appearing in from 10–30 minutes and soon thereafter fading. This reaction is a wheal at least 1 cm. in diameter, with grossly irregular outline sharply marked off from a surrounding pink areola. This reaction has been observed in about 25 per cent of the patients. (2) The late positive reaction noticeable in twelve hours or less and at its height on the second day persists for from 2 to 5 days. This reaction is not unlike the Schick reaction in appearance, "but in order to read and interpret its significance the component features must be noted by touch as well as by sight, and recorded graphically as they change from day to day." It is this chart that decides which of the organisms used in the testing should be used for the treatment. Positive reactions, whether early or late, are considered to be of equal importance as indications for the therapeutic use of the vaccines which produce them. Of sixty-two patients suffering from asthma so treated, fifty-three have been either completely relieved or materially improved.—Thomas, Famulener and Tanart, *Arch. Int. Med.*, 34:85 (July), 1924. L. D. H.

A Defect in Permanent Color Standards Due to Variations in Cobalt Chloride.—Defects in ion standards using cobaltus chloride was found to be due to varying amounts of water of crystallization in sample of the salt. Two samples labelled 2 H_2O and 6 H_2O were found to be almost identical at approximately 4 H_2O. Standards should be made by heating in an oven at 110 to 115° for three or four hours. Then weigh out the equivalent of 20.4 grams of 35.7 per cent H_2O which is about 4 H_2O. Dissolve in water, add 100 c.c. strong HCl and make up to 1 liter. An error in Standard Methods procedure was noted which called for 5 c.c. HCl 1:1 in 50 c.c. Nessler tubes. As the standards were originally made on 100 c.c. samples this should be changed to 2.5 c.c. 1:1 HCl and 5 c.c. KCNS in 50 c.c. tubes. Other permanent color standards using cobaltus chloride are affected in the same way.—M. C. Whipple, *Eng. and Cont. Water Works*, 62:80 (July 9), 1924. E. F. E.

The Filterability of Leptospira Icteroides in Cultures.—The upper portions, representing the richest growth, of four tubes of cultures of Leptospira Icteroides, Peruvian Strain No. 2, grown for eight weeks on Noguchi's semisolid medium, were withdrawn and pooled. Darkfield examination showed refractive granules and numerous actively motile leptospiras. To the 5 c.c. of culture thus obtained were added 10 c.c. of 0.9 per cent saline, and the whole was thoroughly shaken with glass beads and filtered through a Berkefeld filter V, which had been tested before being used and was also tested immediately afterwards. Examination of the filtrate immediately after filtration showed no leptospiras but many refractive granules. Four cubic centimeters of the filtrate were injected intraperitoneally into each of two guinea pigs. Both developed typical symptoms of yellow fever. One died on the fifteenth day and the leptospira was demonstrated in the liver and kidney; the other recovered. The author concludes that the foregoing experiment with cultures of Leptospira Icteroides furnishes confirmatory evidence of the filterability of the organism. Whether it passes through the filter in its spiral form, assisted by its active motility, or in a granular phase, further experimental evidence may determine.—Dieterich, *Am. J. Trop. Med.*, 4:553 (Nov.), 1924. C. C. Y.

Permanent Acquired Immunity.—The authors offer an explanation of the permanent immunity in individuals given by one attack of an infectious disease. Even though specific antibodies may disappear there would seem to be a cellular or tissue immunity remaining. The experimental basis for the author's conclusions was the length of time rabbit hearts continued to beat after injections with toxic products of B.typhosus, using heart of immune and non-immune animals which had been washed free from serum.—Nukada and Matsuzaki, *J. Exper. Med.*, 40:661 (Nov.), 1924. M. S. M.

Dose of Bacteria and Group Infection.—Working with infection of white mice with hemolytic streptococci, the authors studied the

effect of graded doses of organisms. The course of the disease was followed by means of periodic examinations of peritoneal exudate. "As the dosage was decreased a more or less critical point was reached below which infection failed to be initiated."—Bloomfield and Felty, *J. Exper. Med.*, 40:679 (Nov.), 1924. M. S. M.

Blood Platelets in Pneumococcus Infections.—The number of platelets begins to diminish after the infection has become established. Immediately following the onset of the crisis in lobar pneumonia or after the temperature begins to fall by lysis, the platelets begin gradually to increase in number. In the postfebrile period the platelet count increases until the normal is greatly exceeded, and there is a return to normal only after about two weeks. The platelets in general are smaller and contain more granules during the febrile stage. Intravenous injection of antipneumococcus serum during pneumonia produces no variation in the number of platelets.—Reimann, *J. Exper. Med.*, 40:553 (Oct.), 1924. M. S. M.

Treatment of Asthma with Autogenous Vaccines.—The patient was given a complete thorough physical examination. The cultures were made from various sources, depending on the indications in each particular case. Where sputum was obtainable it was always used, as was also aspirated material from infected accessory nasal sinuses. In some instances, either because of some clinical indication or because of failure to obtain positive reactions with bacteria from other sources, cultures were made from the stool. All organisms were made up into separate vaccines. Of sixty-two patients treated, 51.6 per cent were completely relieved of their asthma, 22.6 per cent markedly improved; 12.9 per cent were recent cases, and 12.9 per cent were failures. The age did not appear to be important in prognosis. Some of the patients had relapses, but were promptly relieved after further vaccine treatment.—Thomas and Tanart, *Arch. Int. Med.*, 34:79 (July), 1924. L. D. H.

Vegetative Activity and Pathogenicity.—Studying the activity of hemolytic streptococci in the peritoneal cavity of white mice, the authors found that distinct differences existed between relatively young cultures of bacteria and the same strain during a period of decline as regards invasive power and pathogenicity. These differences must be clearly distinguished from specific alterations in virulence.—Felty and Bloomfield, *J. Exper. Med.*, 40:703 (Nov.), 1924. M. S. M.

Rheumatic Fever in Rabbits and Guinea Pigs.—Whole blood, serum, joint fluid, pleural fluid, throat washings, and suspensions of tonsil tissue all failed to produce nonbacterial arthritis in experiments involving 67 rabbits and 40 guinea pigs, with the exception of two animals. No other evidence was obtained of the transmission of a virus from patients in the acute stages of rheumatic fever.—Miller, *J. Exper. Med.*, 40:525 (Oct.), 1924. M. S. M.

Pulmonary Infection with the Spirocheta and Fusiform Bacilli of Vincent.—The literature is reviewed and a case reported.—McNeill, *Bull. Johns Hopkins Hosp.*, 35:368 (Nov.), 1924. M. C.

Antipneumococcal Serum in the Treatment of Lobar Pneumonia.—The following general conclusions have been drawn from the results obtained in this series of hospital patients: The Type I antipneumococcal serum has a beneficial effect on pneumonias caused by other types of pneumococci, but not so marked as the effect on Type I pneumonias. The best results are obtained when the serum treatment is instituted early in the disease, preferably before the third day. The initial dose of antipneumococcal serum should be 100 c.c. injected intravenously with the precautions previously mentioned. Serotherapy seems definitely to diminish the incidence of post-pneumonic empyema; in fact, in the present series no such cases occurred. In the case of Type I pneumonia, in which horse serum had been injected as a control, empyema developed.—*Lancet*, 2:699-701 (Oct. 4), 1924.

Intradermal Salt Solution Test.—From the study of 70 patients with scarlet fever and 30 patients with diphtheria, it appears that in these diseases the disappearance time of intradermally injected salt solution is reduced. This reduction parallels the severity of the intoxication. The test aids, therefore, in indicating how the patient is getting along and in predicting the outlook for the near future.—W. J. Baker, *Jour. A. M. A.*, 83:1566-1567 (Nov. 15), 1924.

VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

Death **Rates in the United States Registration Area, 1923.**—The Department of Commerce announces that the mortality rate in 1923 for the Registration Area was 12.3 per 1,000 as compared with 11.8 in 1922. Seven states, Colorado, Idaho, Montana, Oregon, South Carolina, Utah and Washington show lower mortality rates for 1923 than for 1922. Of the 6 states which show by color, refined rates for 1923, Maryland has the highest rate for the white population (12.6 per 1,000) and also for the colored (22.8) and Mississippi the lowest (9.7 for the white and 15 for the colored). Of the 24 other states which show refined rates, but not by color, the highest rate (13.3) appears for Delaware, and the lowest (8.7) for Montana.

Eleven cities of 100,000 population and over in 1920, show refined rates by color. New Orleans has the highest white rate (14.5) and Atlanta the highest colored (31.6), while Norfolk has the lowest rates for both the white and colored (8.3 and 18.7 respectively). Forty-four other cities of the same size show refined rates, not by color, and the highest rate appears for San Antonio (15.7) while the lowest appears for Portland, Oregon (9.5)—Dept. of Commerce, Washington, D. C., Dec. 11, 1924.

Principal **Causes of Death, 1923.**—The Department of Commerce announces that 1,193,017 deaths occurred in 1923 within the death Registration Area of continental United States, representing a death rate of 12.3 per 1,000 population as compared with a rate of 11.8 in 1922. The death Registration Area comprised 87.6 per cent of the estimated population of the United States in 1923. The increase in the mortality from influenza, from 31.4 per 100,000 in 1922 to 44.7 in 1923 and from pneumonia (all forms) from 102.1 in 1922 to 109 in 1923 accounts for nearly half the increase in the rate from all causes. Some of the other causes for which the rates increased are diseases of the heart, measles, cerebral hemorrhage, whooping cough, cancer, automobile accidents, nephritis, railroad accidents and accidental falls. Decreases appear in the death rates from tuberculosis (all forms), diphtheria, malaria and typhoid fever.—Dept. of Commerce, Washington, D. C., Dec. 17, 1923.

Fatalities from Accidents, 1923.—The Department of Commerce announces that in 1923 about one-fifth of all fatalities from accidents were the result of automobile accidents. Approximately twice as many deaths from automobile accidents occurred in urban as in rural districts; a difference doubtless due, in part, to the greater number of hospitals in urban districts. Of the 38 states, only Kentucky, Mississippi and Wyoming had higher mortality rates from railroad accidents than from automobile accidents. Wyoming had the highest mortality rate from railroad accidents (34 per 100,000) and Massachusetts the lowest (3.5). Wyoming also had the highest mortality from all kinds of accidents (195.4 per 100,000) and Mississippi the lowest (57). California had the highest mortality from automobile accidents (32.6 per 100,000 population) and also from street car accidents (4.7) while Mississippi had the lowest rate from automobile accidents (4.4 per 100,000 population), and Wyoming had no deaths from street cars. Of the 66 cities of 100,000 population and over, for which rates are shown, Camden had the highest mortality rate from automobile accidents (35.4), Buffalo the highest from street car accidents (8.9), and Scranton the highest from railroad accidents (16.4), and also from all accidents (144.5). On the other hand, the lowest rate from automobile accidents (6.2) was for New Bedford, and the lowest rate from all accidents (47.3) was for Fort Worth; while Duluth, Jacksonville, San Antonio and Yonkers had no deaths from street car accidents, and New Bedford none from railroad accidents.—Dept. of Commerce, Washington, D. C., Dec. 15, 1923.

A Study of Violent Deaths in Four Southern Cities, 1921 and 1922.—The large number of homicides occurring in Memphis, as well as in Atlanta, Birmingham and New Orleans has brought about a study of violent deaths in these

cities for the years 1921 and 1922. Of 549 vehicular accidents occurring in the four cities during these two years, 62 per cent involved automobile accidents. The victims were divided as follows: pedestrians 67 per cent of the fatalities; occupants 21 per cent and the driver only 12 per cent.

The frequency of suicides in the four cities is strikingly uniform and constitutes from 0.5 per cent to 1 per cent of all deaths. Whereas the population studied is 31 per cent colored, the colored suicides constitute only 6 per cent of the total suicides.

The homicide situation is quite different as regards color, 71 per cent of the murderers being colored. In Memphis 36 per cent of the homicides registered there were nonresidents. No definite cause could be ascertained in 40 per cent of the homicides; domestic affairs, love affairs, jealousy or immorality was the direct cause in 20 per cent, fights in 8.8 per cent, robberies in 7.7 per cent, involvement of officers of the law in 6.6 per cent, and traffic in liquor 5 per cent. Interracial homicides are surprisingly few. Of the 739 homicides, 539 persons were apprehended. Only 186 cases had come to trial on the merits, 82 were acquitted and the remaining 104 were convicted and sentenced.

The solution of this exceess number of violent deaths lies in swifter and surer punishment of fault, curtailment of carrying deadly weapons and fewer indiscriminate pardons. The federal government should have a bureau of identifications for criminals and should collect and study adequate data on violent deaths. —J. J. Durrell and W. G. Stromquist, A Study of Violent Deaths Registered in Atlanta, Birmingham, Memphis and New Orleans for the years 1921 and 1922. Department of Health, City of Memphis, Tenn.

Vital Statistics, England and Wales, Third Quarter 1924.—The birth rate in England and Wales 1or the third quarter of 1924 corresponds to an annual rate of 19.3 per 1,000. This is the lowest birth rate recorded for any third quarter except during the period of the war. The deaths registered in this quarter correspond to an annual rate of 9.3 per 1,000, the lowest recorded death rate in any quarter. Influenza was stated to cause 0.6 per cent of the total deaths either as a primary or contributory cause of death. The infant mortality was 53 per 1,000, this being 25 per 1,000 below the average of the 10 preceding third quarters and the lowest rate recorded in any quarter since the establishment of civil registration. The marriage rate for the second quarter corresponds to an annual rate of 17.0 per 1,000 which is 1.3 above that of the second quarter of last year but 0.6 below the average rate in the corresponding quarters of the 10 preceding years.—Quarterly Return Births, Deaths and Marriages, England and Wales, 303, 1924.

Vital Statistics in Scotland, 1923.—The mid-year population of Scotland in 1923 is estimated to be 4,901,100. The reduction over 1922 is due to large emigration. The birth rate was 22.8 per 1,000, being the lowest rate since registration began in 1855, excepting 1917, 1918 and 1919. The marriage rate was 7.19, being higher than in 1922 but lower than in the preceding five and ten years. The infant mortality rate was the lowest on record, 78.9 per 1,000 births, the previous minimum having been 90.3 in 1921. Among the causes of death cancer was more than usually prevalent, with a rate of 130 per 100,000. Fifty years ago phthisis deaths outnumbered those from cancer by nearly 440 per cent but cancer deaths now outnumber phthisis by 60 per cent. The death rate from tuberculosis, all forms, was 118. Heart disease accounted for 10.90 per cent of all deaths, malignant tumors 10.08 per cent, apoplexy 9.13, pneumonia 7.39, diseases of early infancy and malformations 6.72 and tuberculosis of the respiratory system 6.31. —*Brit. M. J.*, 2:782–783 (Oct. 25), 1924.

The Health of Gibraltar, 1923.—The population of Gibraltar is about 17,000. The 1923 birth rate was 22.5 per 1,000, the death rate 16.9 per 1,000 and the infant mortality rate 109 per 1,000 births. Nearly one-third of the infant deaths were due to developmental and wasting diseases, and one-fourth were due to diarrhea and enteritis. There has been no diphtheria since 1914; in 1923 there were 21 cases. During the same period there have been very few cases of scarlet fever and no deaths. In 1923 there was an epidemic of this disease with 218 cases and 5 deaths. Typhoid fever seems to be endemic, there being an average of 25 cases each year, while 19 cases were reported in 1923. The law requires the vaccination of children, with revaccination at 12, with the result that very few cases of smallpox are ever reported, there being none in 1923. It is hoped that the prevailing high infant mortality rate will be reduced by the influence of the new Welfare Center.—*Public Health*, 38:44, November, 1924.

Public **Health in Gambia, Africa.**—The general death rate of the colony of Gambia was 43 per 1,000 in 1923 and the birth rate 26. No plague was reported; cases of smallpox occurred from March to July, but owing to vaccination and isolation, the outbreak was not of a serious character. There were many deaths from tetanus. Due to excessive rain the annual flooding of the chief town, Bathurst, was greatly increased. The standard of health was greatly lowered at that time, the infant mortality being greatly affected.—*Lancet*, 2:736 (Oct. 4), 1924.

Tuberculosis in Germany.—The mortality from tuberculosis in Germany which was gradually decreasing before the war has shown an upward tendency since 1914, and especially since 1918. The highest mortality since the war was reached in 1919, 26.4 per 10,000. In 1923 the mortality was 11.5 per cent above that of 1914. For children under 15 the rate was 2 per 10,000 in 1923 for the large cities of Germany. It is estimated that 12,000 children under 15 died of tuberculosis in total Germany in 1923. Since January 1, 1924, when tuberculosis became a reportable disease in Prussia, 14,000 cases have been reported.—*Jour. A. M. A.*, 83:1604 (Nov. 15), 1924.

Plague in Egypt.—Epidemic plague is present in some part of Egypt during most months of the year. When it recedes in upper Egypt it gains ground in the delta and *vice versa*, each district being a source of infection for the other. From 1142, when the first epidemic in Cairo was recorded, to 1841, 25 notable outbreaks of plague occurred. Plague then disappeared from Egypt for fifty-five years, reappearing in Alexandria in 1899. Since 1902, when it became widespread in the delta and definitely infiltrated in upper Egypt, there has been a general dispersion throughout the country. The extent of plague at any moment in the epidemic period is believed to depend on the weather that prevails about six weeks before, the intervening period being required for rat fleas to develop. Plague is not so widespread in Egypt today or so intense as of old, probably because of the high average immunity of the Egyptian rat through inheritance. There is a decided tendency in upper Egypt to the pneumonic type of plague, both pure and mixed; 83 outbreaks of pneumonic plague occurred in the provinces of Qena and Girga from 1899 to 1913, but the number of cases was small in contrast to the epidemics in Manchuria and Mongolia. The greatest prevalence of pneumonic plague is coincident with the hottest and dryest time of the year.—*Jour. A. M. A.*, 83:1612–1613 (Nov. 15), 1924.

The Seasonal Prevalence of Infantile Paralysis.—There is a marked seasonal variation in the ratio of reported morbidity to reported mortality of infantile paralysis. This variation is probably due largely to failure to recognize the milder forms of the disease in its "off season" and to a lesser extent to delayed reporting of cases as against prompt reporting of deaths.

According to a calculated seasonal morbidity on the basis of these observations, infantile paralysis, although preponderantly a summer disease, prevails to a greater extent in the season from December to May than is shown by the reporting of cases. A calculated morbidity for 1921 also shows a secondary increase in the prevalence of the disease in March, which was not shown in the reporting of cases.—W. L. Aycock and Paul Eaton, *Am. J. Hyg.*, 4:681–690 (Nov.), 1924.

Reinfection in Syphilis.—The thirteen cases of syphilitic reinfection reported from records of 5,000 cases satisfy quite closely the requirement laid down to constitute a true infection. A diagnosis was made in 12 of these cases and treatment started at extremes of from 3 to 12 weeks, with a median of 6½ weeks after exposure. Only one old syphilitic patient was treated. These patients, on an average, received from 6 to 24 injections of arsphenamin, with a median of 12 injections, and from 15 to 50 mercuric salicylate injections, with a median of 25 injections in order to render them bacteriologically free from spirochetes. The period of time that intervened between the first and second infection varied from one month to 120 months, with a median of 15 months. This seems to indicate that the first syphilitic infection confers no immunity on its host for any period afterward. As soon as he is free from the first infection, he is open to another. Syphilitic reinfection is probably more frequent than we suspect. The curability of syphilis, however, seems definitely possible provided: (a) an early diagnosis can be made by the dark field, and (b) early, vigorous treatment can be instituted with arsphenamin and mercury injections.—J. R. Driver, *Jour. A. M. A.*, 83:1728–1733 (Nov. 29), 1924.

SANITARY ENGINEERING

ABEL WOLMAN, C.E.

Dewatering Garbage During Collection and at Disposal Plant.—Dewatering device consisting of a perforated load-sustaining plate placed in the garbage collection trailer permits clean dumping of solids in the vehicle, as well as thorough cleansing of the water compartment. Instances where more than 150 gallons of water have been drained from a single trailer, from the time collection starts until the garbage is dumped at reduction plant, have been noted.—*Am. City*, 31:533 (Dec), 1924. A. W. B.

The Bombay Water Supply.—The conclusions reached at a meeting to consider the question of purification of Tansa Lake Water are briefly summarized as follows: That for practical purposes the water can be made safe by chlorination alone, and although eventually filtration may be desirable in order to produce a perfectly clear water, considerable time must elapse before this can be effected, and the expense of doing so will be considerable. In view of the liability of the supply to contamination, it is desirable to install as soon as possible, a plant capable of effecting continuous chlorination of the enlarged supply in such a manner as will enable this plant to be subsequently incorporated in a filtration scheme when and if such a scheme is adopted. —*Local Self-Gov. Gaz.*, 10:418 (Sept.), 1924. A. W. B.

Filtered Water Supply for Calcutta.—The problem of increasing the present supply of filtered water, before the new water works extension scheme comes into operation has been engaging the attention of the present corporation. Although the new water supply scheme will not be completed for three years, three of the filter beds will be completed in December. To handle the increased amount of water, a new engine of 45,000,000 gallons per diem capacity will be installed. The existing force main being old, it is not advisable to attempt to force more than 45,000,000 gallons of water per diem and the question of sinking tube wells in different parts of the city is being considered.—*Local Self-Gov. Gaz.*, 10:421 (Sept.), 1924. A. W. B.

Scheme for the Improvement of the Rangoon Milk Supply.—A coöperative model dairy farm or a municipal model shelter is recommended to improve existing conditions. The former scheme tends to raise funds by popular loans for a model dairy farm consisting of 200 heads of cattle. This plan in addition to serving a wholesome milk will yield an annual profit and stimulate local enterprise on healthy lines.

The second scheme provides a shelter to meet the needs of owners who cannot afford to comply with the minimum sanitary requirements. The milch cows would be accommodated at nominal fees, the feeding and other arrangements to be carried out by the owners or their representatives, but the milking permitted only under supervision.

The coöperation of neighboring municipalities is necessary to attain satisfactory results. To achieve speedy results a few sets of awards should be offered annually for the best kept milch cows and dairies and the best record of milk both qualitatively and quantitatively.—Dr. Ba Yin, *Local Self-Gov. Gaz.*, 10:410 (Sept.), 1924. A. W. B.

Housing Conditions on Barges.—The means of ingress and egress into flats and barges which is nothing more than a square hole cut in the deck provided with a cover, permits the entrance of water when the top is up, and when the top is down shuts off light and ventilation. A shape like a quarter drum with one flat side fitting over the opening and the other flat side vertical from the deck, is recommended to overcome unfavorable conditions caused by flat tops.—*Pub. Health*, 38:62 (Nov.), 1924. A. W. B.

Purification of Trade Wastes.—Pollution of canals in Holland by trade wastes has gradually increased to a high degree and wastes from sugar, dairy, strawboard and potato flour industries have been largely responsible for nuisances. Methods of efficiently treating these wastes are described. Passing of efficacious laws is necessary to obtain definite results.—H. Kessener, *Eng. & Cont.* 62:1067 (Nov. 12), 1924. A. W. B.

INDUSTRIAL HYGIENE

DRS. E. R. HAYHURST AND N. C. DYSART

Some **Medical Problems in Connection with Chemical Warfare.**—The article gives a brief résumé of gas warfare beginning with chlorine gas by the Germans in April, 1915, followed by phosgene, chloropicrin, "mustard gas" (June, 1917), etc. A classification of gases was made in accordance with the main pathological condition produced.

(1) Acute lung irritants include those acting immediately with the consequent edema, such as chlorine, associated with respiratory distress and want of oxygen, and those producing the same condition only after a period of time, such as phosgene. These cases fall into two main groups, the one in which the patient shows venous engorgement, plum-colored cyanosis of the face, lips, and tongue, increased depth of breathing, with a fairly slow, good tension pulse; the other being manifested by ashen pallor, collapse, rapid and shallow breathing, and a weak and thready pulse. The effusion into the lungs depletes the blood, which becomes concentrated and more viscid. The effusion also prevents respiratory exchange mechanically. The resulting want of oxygen is the danger and all efforts must be directed to its alleviation. Fatal cases due to edema usually occur within twenty-four hours. Otherwise, removal of the edema gradually sets in, and by the end of a week convalescence is well established. Bacterial infection may follow, but death from this cause is not so common as might be expected. Treatment consists in absolute rest, warmth, oxygen, and venesection, with or without infusion in selected cases. The large number of cases thus treated during the war proved beyond doubt the efficacy of the treatment. Contrary to early predictions, only a few cases of fibrosis, chronic bronchitis, emphysema, which simulates tuberculosis, have been observed as a sequel. Emphatically, gas poisoning is not related to tuberculosis. Furthermore, "effort syndrome" is a neurosis showing shallow breathing with consequent want of oxygen which yields to oxygen treatment and has no relation to previous gassing.

(2) The second group of poison gases was named "vesicant," of which mustard gas was the outstanding member; great though its casualty producing power (it caused not less than 80 per cent of our gas casualties) it does not give rise to high mortality in troops disciplined in gas defense.

(3) A third group consisting of arsine preparations appeared in the closing phase of the war, causing temporary inaction but without high ultimate casualties.

Of this list those causing *anoxaemia*, or oxygen want, are important. Anoxaemia is the term applied to conditions where there is an interference with the oxygen supply to the tissues. It may arise from a variety of causes such as deficiency of oxygen in the atmosphere, interference with gaseous interchange in the lungs, diminution in the capacity to transport oxygen in the blood vessels in the normal quantity, abnormal destruction of red blood corpuscles, factors changing the hemoglobin whereby it is no longer capable of combining with oxygen (carbon monoxide poison), or finally any cause interfering with the free liberation of oxygen from the corpuscles to the tissues.

Anoxaemia may have serious secondary effects, as on the circulatory organs, the nervous system or other organs, which effects not infrequently are a factor of considerable importance in the later history of cases. In either clinical group—livid cyanosis or pallid collapse—there is a grave deficiency of oxygen. What is the probable cause? Haldane says that in pneumonia where the greater part of both lungs is entirely blocked by consolidation there is commonly no cyanosis because there is little blood passing through the consolidated parts. What passes through the healthy portion is amply sufficient for respiratory requirements during rest. This permits, often, ten times the exchange during work, so that during rest in bed only a little circulation through the lungs is necessary. But when cyanosis occurs we are driven to the conclusion that the entry of oxygen into the blood through the alveolar wall is impeded, as in exudation. It is very important to rea-

lize that this may occur without any impediment to the passage of carbon dioxide outwards. Carbon dioxide is about twenty-five times as soluble in water as oxygen, and hence passes through the alveolar walls far more easily than does oxygen.

In one type of anoxaemia, indicated by *cyanosis*, there is a retention of carbon dioxide, hyperpnea, and evident distress. In the other type with *grey appearance*, pallid lips, shallow breathing, no distention of the veins and little respiratory distress, there is no retention of carbon dioxide. The latter, however, is the more serious type. Fundamental physiology explains the difference. Lung ventilation is so governed through the action of arterial blood on the respiratory center that the percentage of carbon dioxide in the alveolar air remains nearly constant. An increase of about 0.2 per cent in the alveolar air of carbon dioxide doubles the breathing during rest, while a diminution of 0.2 per cent produces a temporary cessation. The change from inspiration to expiration is effected by chemical stimulus—carbon dioxide—on the governing center. In reality the respiratory center reacts to an increased hydrogen-ion concentration in the blood. The sensitiveness of the center to hydrogen-ion concentration is very great.

Stadie and Meakins showed that in pneumonia there is considerable lowering in the oxygen saturation in the arterial blood and that this has a direct relation with the degree of cyanosis. Undoubtedly the grey circulatory and nervous phenomena which occur are in a great part the result of anoxaemia. Therefore, perhaps *the most important treatment of pneumonia*, apart from the specific cure of the infection, is the prevention of anoxaemia. The early administration of oxygen to such cases is most imperative as there is great danger of being too late when the circulatory paralysis appears.

The longer anoxaemia lasts, the more serious is the damage to the central nervous system and the longer does it take to recover from this damage. This is well shown in *carbon monoxide poisoning* where if a man has been unconscious for some hours in the poisonous atmosphere he is not likely to recover, although practically all the carbon monoxide is out of his blood within two or three hours, so that the anoxaemia is completely removed. In such cases, as in pneumonia with prolonged anoxaemia, oxygen cannot be expected to have its usual effects. Recovery cannot take place in spite of an adequate supply of oxygen if the cells of the central nervous system have been sufficiently damaged. The damage to the respiratory center is the most serious. Normal response to stimulation ceases and the nervous centers pass into a condition resembling narcosis.

In respect to the heart, anoxaemia destroys its efficiency, the tone and contracting forces are depressed and dilatation occurs.

"It will thus be seen that anoxaemia plays an important part not only in cases of gas poisoning, but also in medical cases that occur in general practice, and is a subject which has not heretofore received the attention that is its due." A short and sudden starvation of oxygen to the tissues is fraught with very disastrous results. Where anoxaemia develops, speedy relief by the administration of oxygen is imperative. Whether cyanosis is of the blue or grey type, oxygen should be speedily administered. Absolute rest, lying down, is necessary. The oxygen is only given to enable a patient to surmount a temporary crisis due to anoxaemia.

A very simple method of administering oxygen will suffice, such as a small cylinder of oxygen furnished with an India rubber tube directed into the patient's open mouth. For longer administration, more practical apparatus may be used. Some methods are ineffectual or extremely wasteful. One improper method is to place a funnel over the patient's face which allows an indefinite amount of oxygen to pass while the patient rebreathes a good deal of expired air. He may get hardly any of the oxygen as being heavy it runs out below. The rubber tube may be passed into the patient's nose. Where pure oxygen is given it may be passed into a rubber bag connected with the inspiration valve of an anaesthetic mask placed over patient's mouth and nose. The patient inhales from the bag and exhales to the outside through an expiratory valve in the mask. The Haldane apparatus, devised during the war, economizes oxygen, and permits the continuous administration over two or three days at a time during which the patient may sleep comfortably. To keep the color normal may require from one to three litres per minute. In any case pure oxygen should not be given for a very long time because it has a slow irritant action on the lungs. The physician will have to determine the proper course to pursue.

Leonard Hill has devised an apparatus for the continuous administration of oxygen especially for pneumonia cases. "The main feature of his apparatus is that the patient is inclosed in a small chamber made of fabric to which oxygen is admitted at a given rate, and from which carbon dioxide is removed by soda lime. This device can be folded into such a small compass, and is so light, that the doctor can easily carry the whole equipment, including the oxygen cylinder in his motor car."

Oxygen also has a favorable influence in the treatment of chronic gas casualties where shortness of breath with rapid pulse persists.

FINAL EMPHASIS

The early recognition of anoxaemia and its dangers is important together with the necessity of its immediate relief by the administration of oxygen. Venesection is a helpful measure in venous engorgement after the critical period when the heart is beginning to fail, but should not be used in the ashen grey or pallid cases. Saline injections with gum arabic or acacia in strengths of 6.5 to 7 per cent, in 0.9 per cent sodium chloride solution are unquestionably helpful and have an osmotic pressure equal to that of the colloids of the blood as well as the same viscosity. These "gum salines" may be utilized in many conditions that occur in general practice, particularly hemorrhage and shock.—Gerald R. McCowen, *J. State Med.*, XXXII, 6:277 (June), 1924.

The Effect of Health Insurance on Workers.—That the present insurance scheme (Great Britain) has justified itself, was made evident in the whole-day conference of the British Medical Association, when representatives of every section of the community affected by the Insurance Acts expressed concurrence with its general principles. Among the advantages of the present scheme are enumerated the following:

1. It has helped to establish a health consciousness in the state.

2. It has revealed a volume of sickness among the workers not hitherto realized.

3. It has shown the effect of sickness on industry and the bearing of environment and conditions of industry on sickness incidence.

4. It has demonstrated the scope for cooperation between insurance practitioners and the medical officer of health.

5. It has pointed to the need for adequate hospital accommodation and for specialist and consultant services.

6. It has proved the possibilities of a thoroughly efficient medical service in providing an opportunity for the insured person to consult a general practitioner at the earliest stages of illness and for the practitioner to study disease in its beginnings.

7. It has brought the practitioner face to face with the problem of industrial efficiency.

"Nevertheless, with all the progress recorded there is still no doubt that, as Sir William Glyn-Jones remarked at Bradford, the scheme has not redeemed the many promises made for it by its political parents at its conception. How the defects can be remedied and what immediate developments can be undertaken will doubtless be the chief concern of the Royal Commission."—*Lancet*, No. 5276:759 (Oct. 11), 1924.

Acclimatization.—Haldane discusses acclimatization to higher altitude, principally, but the picture holds true for low partial pressure of the oxygen in the air and consequently that supplied to the tissues by any similar cause such as severe muscular exercise, carbon monoxide poisoning, pneumonia, etc. The symptoms present in the *unacclimatized* persons are measurable by altitudes At five or six thousand feet, on exertion there is panting and increased pulse. At three or four thousand feet higher, perhaps even during rest, occur symptoms known as "mountain sickness" of which nausea, vomiting, and headache are the chief ones. At greater altitudes (or depressions of barometric pressure) blueness of the lips and abnormal mental symptoms appear. Some persons show periodical breathing and their sleep is disturbed. At eighteen thousand feet (when only half an atmosphere is reached) vision and hearing are affected as well as the power of remembering events, and therefore of forming clear judgments. At about 25,000 feet, complete helplessness, marked blueness of the lips with possible unconsciousness and death from failure of respiration may occur. If, however, oxygen is substituted for nitrogen, these symptoms are wiped out completely.

If the person is *acclimatized*, these symptoms can all be prevented so that persons who ascend gradually to heights of 20,000 feet or more will probably never experience "mountain sickness" through acclimatization.

Haldane offers almost indisputable evidence that acclimatization is due to the active secretion of oxygen inwards and is not a mere chemical and physical phenomenon.

Whenever breathing is shallow with accompanying rapid respirations, the air in the different alveoli of the lungs varies in composition in different parts. The result is that the pressure of oxygen in the mixed arterial blood is lower. We have thus a simple explanation of why, before acclimatization, there is cyanosis. Through the carbon monoxide method of investigation, Haldane and his coworkers found that, in mice, for example, acclimatization to fairly prolonged exposure (to the resulting oxygen shortage) brought about an oxygen pressure in the blood higher than that in the air cells of the lungs.

Muscular exertion results similarly. The hard breathing is not due to mere excess of carbon dioxide, but shortage of oxygen. Very hard work is greatly facilitated by an increase of oxygen in the air. In acclimatization this increase in oxygen pressure in the blood (which is also true in carbon monoxide poisoning) is the result of actual oxygen secretion in the lungs which, in turn, originates in some stimulus coming from the deprived tissues. As would be expected, oxygen secretion becomes more ready and powerful with practice. However, when one is acclimatized (to altitudes, hard muscular work, or carbon monoxide inhalation) very little benefit results from enriching the air with oxygen. Very great benefit results to those who are not acclimatized. Thus a man in good training actually prevents shortage of oxygen in his arterial blood. "Nervous disordered action of the heart" or "D. A. H.," in the presence of even slight diminution of atmospherical pressure, may produce urgent symptoms which would not occur in normal persons.

In low oxygen pressures, increased breathing results. This washes out carbon dioxide, thus making the blood and the whole body more alkaline—in other words, produces a state of alkalosis. The urine becomes alkaline or much less acid. Therefore the increase in breathing is not due to an acidosis, but an alkalosis. In acclimatization, breathing is always increased even during rest. In one acclimatized, illness may break down or overtax the oxygen secretion process, which accounts for the tragic death of Dr. Kellas who was otherwise acclimatized, while at a very high altitude in the Mt. Everest expedition. As Barcroft found in Peru, persons living at high altitudes have a bluish tinge to lips and skin and become distinctly pinker when removed to lower altitudes. This is similar to what we see in persons with chronic emphysema, certain chronic heart affections, etc., going about and leading a fairly normal life. They have become "acclimatized." This fact has long obscured the deadly significance of cyanosis in other patients who are not gradually acclimatized, and the urgent need so strongly emphasized by Meakins, of combating cyanosis by continuous enrichment of the inspired air with oxygen. In the Mt. Everest expedition, Col. Norton and Dr. Somervell climbed without the oxygen to 28,100 feet and slept well at 27,000 feet. Only on the theory of oxygen secretion could this physiological adaptation be explained, also that in the less completely acclimatized, more benefit is obtained from oxygen.

The acclimatized person is one in a different physiological state of being. His breathing is greatly increased; his hemoglobin and red corpuscles and blood volume are increased; his blood plasma is altered in composition; the blood from the bone marrow is greatly increased; and if we could detect it, we should probably find physiological changes in his lung epithelium. These changes center in an attempt to keep the oxygen pressure and the hydrogen-ion concentration constant in the living tissues. "The every day reactions of living organisms to change in environment seem to me not in any way different in kind from the reactions during acclimatization to higher altitudes." Biology is still an independent science separated completely from mere applied physics and chemistry.—J. S. Haldane, *Brit. M. J.*, (Nov. 15), 1924, 885-890.

A Case of Iron-stone Phthisis.—The author cites the instance of an iron-stone worker who breathed dust composed of iron carbonate and oxide which developed fibrosis. X-ray photographs strikingly resembled early silicosis, yet there was present only a small quantity of quartz in the analysis of dust from the mine where he worked. Evidently the poisonous properties of large quantities of iron in the lung had an injurious effect in this case. Secondary tuberculosis infection followed. The period concerned was from July, 1912, until death, February 17, 1924.—Sir Kenneth Goadby, *Lancet*, No. 5276:752 (Oct.), 1924.

FOOD AND DRUGS

HARRY W. REDFIELD, PH.D.*

What Do You Want?—The newly appointed editor for Food and Drugs Notes would greatly appreciate an expression of your desires as to what kind of material you would find of most value and interest in these three or four columns for which he is responsible. Please write and tell him. Do you wish abstracts of important articles concerning foods and drugs which have appeared elsewhere, or do you already have access to these through other publications? Have you questions which you would like to have answered in these columns? If so, please submit them. Have you interesting new and valuable bits of information which should be made available to others concerned with food and drug matters? If so, we would be very glad to have you submit such information as the basis for a note. Or, would you prefer a running comment on current events, giving the editor's slant on what appears to him to be of most importance to food and drug officials with possibly no reference to publication elsewhere? Our sole aim is to use the space available to the best advantage, or in other words, to give the composite reader what he most wants. This obviously cannot be done unless you do your part. To assist you, a mailing address is given at the foot of this page and a series of samples follows.

Chicken Embargoes.—The embargo placed by the New York City Department of Health in December upon live poultry from eight midwest states, followed by even more drastic embargoes in New Jersey, Maryland, Pennsylvania, California and Connecticut, which excluded live poultry from all other states, except by special permit in some cases, revealed a situation so serious that Congress appropriated $100,000 for a campaign by the United States Department of Agriculture to discover the source of the trouble and to remedy it. The first statement issued by the Bureau of Animal Industry as of December 20, in connection with this investigation, contains so much of value to food officials who may have to deal locally with this question of infected poultry that extracts from it are here given:

"Several weeks ago Dr. Veranus A. Moore, of Cornell University, brought to the attention of the United States Bureau of Animal Industry the existence among poultry of a disease which he diagnosed as the European fowl pest, hitherto unknown in the United States. Investigations made in New York City, Jersey City and Philadelphia by representatives of the Bureau confirmed this diagnosis.

SYMPTOMS

"The disease is characterized by its extremely infectious nature, rapidly progressing course and high mortality. Conspicuous symptoms are depression and loss of appetite followed by prostration. The comb and wattles usually become purple and sometimes swollen. Sticky exudate may paste the eyelids together, clog the nasal passages and even obstruct the windpipe, causing labored breathing. A greenish yellow diarrhea may be present.

AUTOPSY FINDINGS

"The nasal passage, larynx and windpipe contain some mucous exudate. Blood-stained patches and sometimes blood clots are found in the windpipe. The lungs are usually more or less pneumonic. A hemorrhagic or 'blood shot' condition is found on the crop and under the skin in various other parts, sometimes accompanied by a gelatinous exudate. Hemorrhagic spots on the muscle or fat of the heart, on the gizzard fat, on the outer surface of the small intestines and especially on the inner lining of the glandular part of the stomach and gizzard are considered as diagnostic evidence of European fowl pest. Serous fluid is sometimes within the heart sac, or in other cases in the body cavity.

TREATMENT

"Since treatment of affected birds is futile, the aim should be to prevent so far as possible the spread of infection. The first fowls showing symptoms should be destroyed by a method which would guard against the contamination of the premises. The carcasses

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should be burned or buried deep. The healthy fowls should be moved to new quarters if possible and carefully watched for signs of disease. Houses and runs should be thoroughly cleaned at frequent intervals and disinfected with carbolic acid in 5 per cent solution. The drinking water may be made antiseptic by adding one-third teaspoon of permanganate of potash to each gallon, a procedure which serves to prevent the spread of disease through the water and also is a convenient means of administering an internal antiseptic.

CONTROL MEASURES

"It should be remembered that there are other poultry diseases prevailing that may be mistaken for fowl pest. Diseased chickens have been received for study from several points in the Central West within the last few weeks, but fowl pest was not encountered in any of these shipments."

Under date of December 22, the following order was issued by the United States Department of Agriculture as B.A.I. Order 291:

"Whereas, the fact has been determined that certain contagious diseases of poultry exist in the United States,

"Now, therefore, under the authority conferred upon the Secretary of Agriculture by Section 2 of the Act of Congress approved February 2, 1903 (32 Stat. 791), the following regulations are hereby prescribed:

"No live chickens, turkeys, or geese affected with or directly exposed to the contagious disease known as European fowl pest or other similar contagious poultry disease, and no carcasses of such animals which have died from any such disease, or manure or litter from such diseased animals, shall be shipped, transported, or moved from one state or the District of Columbia into another state or the District of Columbia.

"No cars or premises which have contained shipments of any of the animals named in this order which have been found infected with European fowl pest or other similar contagious poultry disease, and no coops, containers, troughs, or other accessories used in the handling of such infected animals, shall be used in connection with the interstate movement of healthy animals of the same kind until the said cars, premises, coops, containers, troughs, or other accessories have been cleaned and disinfected under the supervision of the Bureau of Animal Industry of the United States Department of Agriculture with a permitted disinfectant, as provided in B.A.I. 273, or with a 3 per cent solution cresol compound, U.S.P."

Following the receipt of this order a delegation of poultry receivers in New York City and its environs went to Washington for a conference, and they reported that the federal authorities were anxious to coöperate and rather minimized the dangers which certain state officials have feared, their belief evidently being that the trouble is localized to a great extent at consuming points, especially New York, where much attention will be given to the inspection and sterilization of cars, coops and railroad terminals. There the matter rests as we go to press.

Contamination of Food by Galvanized Iron Containers.—A request for information on this subject has been received. Several publications regarding the matter have issued from the Bureau of Chemistry of the United States Department of Agriculture, to wit, Press Notice of August 2, 1923; Official Record of United States Department of Agriculture of August 22, 1923; Industrial and Engineering Chemistry, Vol. 16, No. 2, p. 164 (Feb., 1924). From these we learn that twelve men at the Guam Naval Station each drank a bottle of root beer and immediately began vomiting. Chemical examination of the contents of three bottles transmitted to the Bureau disclosed the presence of substantial quantities of a salt of zinc in each bottle, to the extent of 229 mg. per liter, which is equivalent to 3.3 grains of zinc chloride per 15 fluid ounce bottle. At about the same time four thousand galvanized iron buckets were distributed as premiums in the District of Columbia by a chain of grocery stores and as it seemed quite probable that some of these buckets would be used for holding liquid food, such as cider or lemonade, or in the preparation of preserves or fruit jellies, experiments were conducted to ascertain the degree to which ordinary galvanized iron buckets are corroded by some of the commoner liquid foods. The results are tabulated:

	Zinc as Mg. per Liter.	
	After 17 Hours	After 41 Hours
Tap Water	5	21
Distilled Water	9	27
Carbonated Water	193	181
Milk	438	1,054
Orangeade	530	854
Lemonade	1,411	2,700

Blanks showed less than 0.1 mg. of zinc per liter in the tap water and distilled water, and 7 mg. in the carbonated water. Milk ordinarily shows about 5 mg. In general, the quantity of zinc found in each liquid varied with the hydrogen-ion concentration, with the titratable acidity and with the time of exposure. The pails which contained the milk, orangeade and lemonade were visibly corroded. Another case of poisoning by zinc at a large institution near London was reported in the *Lancet*, 204, 214 (1923), from which it appears that over two hundred persons developed typical symptoms of zinc poisoning immediately after a meal consisting of bread, margarine, stewed apples and tea. Investigation showed that the apples had been cooked in galvanized iron baskets placed in iron steamers and that the fruit acids had dissolved the zinc from the baskets. It is, therefore, apparent that in investigating cases of food poisoning, federal, state and city inspectors should always bear in mind the possibility of metallic contamination, and wherever food has been in contact with metal to make careful note of the fact so that suitable special tests can be conducted when such action seems to be advisable.

How Much Opium and Coca Leaves Are Required to Meet the Legitimate Needs of the United States for a Twelve Month Period?—This question has been studied by Katharine B. Davis, Ph.D.; Raymond B. Fosdick; George W. McCoy, M.D.; Lafayette B. Mendel, Ph.D.; W. S. Richardson, Thomas W. Salmon, M.D.; William F. Snow, M.D.; Hans Zinsser, M.D.; Charles E. Terry, M.D.; and Mildred Pellens, A.B., comprising the Committee on Drug Addictions of the Bureau of Social Hygiene, Inc., in coöperation with the United States Public Health Service and the Narcotic Division of the Bureau of Internal Revenue. The study was undertaken in order to make available for use by the international conference, called on invitation by the League of Nations, certain data which might prove valuable as a basis for any estimates made in a consideration of the limitation of the production of the drugs concerned.

The result of the study has been published in pamphlet form. The address of the Bureau of Social Hygiene, Inc., is 370 Seventh Avenue, New York City. The international conference, we are told by press reports from *The London Daily News*, failed because opium is a vested interest in certain regions of the British Empire, and 3 per cent of India's revenues are now drawn from the export of opium. To quote this daily further: "India herself has admitted by her almost completely successful efforts at wiping out the practice of opium smoking, that the habit is an evil one, but the export of opium is still justified, on the ground that as long as Turkey, Afghanistan and Persia continue producing all they can, and making profits out of it, India might as well join in the game."

The Oyster.—Attention having recently been focussed on the oyster as a possible carrier of disease, some bits of information regarding the structure and feeding habits of these bivalves may be helpful to some readers. From "Hygienic Fundamentals of Food Handling" by Thom and Hunter, we learn that the oyster is provided with cilia, which are hair-like processes, which by their wave-like motion maintains a current in the shell liquor which moves the food particles from their point of entrance between the lips of the shell to the oyster's mouth. During active feeding suprisingly great amounts of water are thus taken in by the oyster, amounting in a day to many times the weight of the oyster. From this relatively immense amount of water the solid particles of food and whatever bacteria may be present are actually filtered out in the body of the oyster. The temperature of the water by which the oyster is surrounded has a marked effect on the feeding process, for the reason that with decreasing temperatures the shell closes tighter and tighter and also the cilia move less and less energetically. Oysters feed less actively as the temperature drops below 60°, and at 50° F. they almost entirely cease feeding, while at temperatures below 45° F. they are in the condition which has been called hibernation.

During the hibernating period very few bacteria are ingested by the oyster and the bacteria within the oyster at the time so-called hibernation begins, tend to disappear. For this reason the menace to public health from eating oysters from polluted areas is reduced to a minimum during the period while the water is below 45° F. But, although the oyster within the shell may be free, or nearly free from bacteria during this period, this is not true of the outside of the shell which may be grossly contaminated with bacteria from the polluted water and mud. Upon shucking such oysters, the bacteria from the outside

of the shell would contaminate the oyster meat. Therefore, oysters from badly polluted waters should not be eaten even during the hibernating period. The expedient of cleansing such oysters by washing after shucking has been proposed and may be helpful to a degree, but due to the slimy character of the oyster meat, to attempt to wash off all of the bacteria is futile. Moreover, Houston, 4th Rept. of Royal Sewage Commission, 1904, p. 220, showed that in spite of thorough washing it is impossible to wash infected oysters free from some kinds of sewage bacteria which have been found in the stomach of the oyster.

At least six separate and agreeing investigations have demonstrated the ability of oysters to cleanse themselves when transplanted from polluted to bacteriologically clean water. Obviously then, the chief concern of any health officer is to learn whether the shell oysters sold in his community come from clean waters. The United States Bureau of Chemistry has indicated its willingness to supply information on request through its Office of Coöperation, to authorized city and state officials.

If oysters in the shell have come from clean waters and are alive, as they should be and as shown by the fact that the valves of the shell will be tightly closed and will remain so until they are opened by the insertion of a thin bladed knife between the valves and by cutting the large adductor muscle which holds the valves together, there is little to fear. In the case of shucked oysters the situation is slightly more complicated. Not only is there the question of the purity of the water from which the oyster was taken, but also the shucked oyster is subject to contamination from the dirt on the outside of the shell during the shucking process, from the hands of the shucker, from the container into which it is shucked and from the other objects such as dippers and paddles with which it comes in contact in the shucking house. The number and kinds of bacteria present in the shucked stock as it reaches the consumer may be different from the number and kinds present in the shell stock. Even in this case, however, the Bureau of Chemistry will probably have the necessary information available.

ABSTRACTS

Basal Metabolism.—The problems on basal metabolism that are under active investigation in this country at present form the subject of this review. The material is discussed under the following headings: Apparatus, standard conditions for determination of basal metabolism, regulation of the body temperature, specific dynamic action of foods, fasting and undernutrition, the effect of work, pregnancy, menstruation, drugs, the basal metabolic rate in diseases other than thyroid, leukemia, thyroxin and myxedema, adenomatous goiter with hyperthyroidism and exophthalmic goiter, adrenalin, insulin, diabetes, and the basal metabolism and respiratory quotient in relation to a possible conversion of fat into a carbohydrate-like substance.

The extensive bibliography appended contains a list of general reviews and books, followed by separate bibliographies from the various metabolism laboratories and list of general references on the subject since 1920. —W. M. Boothby and I. Sandiford, *Physiol. Rev.*, 4 (1924), No. 1, pp. 69–161, figs. 4.

Iodine Deficiency and Prevalence of Simple Goiter in Michigan.—Preliminary Report. —In this preliminary report are summarized the results of a survey of the extent of simple goiter in four counties in Michigan selected on account of the widely varying content of iodine in the ground water of these counties. The average iodine content of the water in parts per billion was 8.7, 7.3, 0.5, and 0, respectively, and the corresponding percentage of simple goiter 26.0, 32.7, 55.6 and 64.4 per cent. Other points of interest brought out in the survey were a uniformly higher incidence of goiter among girls than boys, a lower scholastic grade among those affected with enlarged thyroid, and striking differences in the incidence of goiter, and in the iodine content of the water in localities separated by only a few miles.

In discussing various methods of preventive treatment, the opinion is advanced that the most practical method, which has not been tried as yet, is that of requiring by law that all salt sold for human and animal consumption in goitrous areas contain sufficient iodine so that the minimum requirements of 300 mg. a year would be normally consumed by everyone in the area.—R. M. Olin, *Jour. A. M. A.*, 82 (1924), No. 17, pp. 1328–1332, figs. 5.

The Question of Vitamins—I, The liposoluble factor (*trans. title*).—A very complete summary is given of the literature on vitamin A, including the various vitamin A deficient

diets used in different laboratories, the physiological effects of lack of vitamin A, methods of testing for its presence, and its physical and chemical properties and occurrence. An extensive bibliography is appended.—H. Simonnet, *Bul. Soc. Chem. Biol.*, 5 (1923), No. 7, pp. 539-689, figs. 27.

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CHILD HYGIENE

TALIAFERRO CLARK

Proposed New Classification of Juvenile Tuberculosis.—Two years ago a committee of the American Sanatarium Association presented the following report on the classification of juvenile tuberculosis. It was voted to try out the proposed plan and bring it up for consideration at a subsequent meeting:

> The scheme now in use for the classification of tuberculosis was intended to apply to the adult type of disease, which is distinctly pulmonary. Pathologists find that whenever a person has pulmonary tuberculosis that the lymph nodes nearly always show evidence of the same disease. Even if the primary focus of infection from the pathological point of view may have been the lung, the important fact remains that in children the first tuberculosis lesion that the clinician can demonstrate is most frequently found in the lymph nodes and tissue of the hilum.
>
> Tuberculosis in children under three years of age is usually a general type. If it does localize in the hilum the diagnosis can only be arrived at by exclusion, as physical signs are absent or ill defined.
>
> Tuberculosis as it is found in children over three and under twelve years of age is a distinctive type in that the lesions are first found in the lymph nodes about the trachea, the bronchus and its large subdivisions. It may involve the lymphoid tissue that is in close contact with the branches of the bronchial tree and later produce lesions in the adjacent tissue. It rarely involves the apices, but when this does occur we have the adult type of pulmonary disease.
>
> It does not seem consistent to classify a child with tuberculosis limited to the bronchial glands and the root of the lung in the same group with adults who exhibit lesions to the extent that is defined under the term minimal.
>
> The committee therefore makes the following recommendation—that the term "Hilum Tuberculosis" be added to the present classification; that it should be used to define those cases of tuberculosis that present the following symptoms and physical signs:
>
> SYMPTOMS
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> Local—Frequent "colds," cough, hoarseness, rarely loss of voice, often all local symptoms are entirely absent, and when they appear they are usually transitory.
>
> Constitutional—Undue fatigue, lassitude, nervous irritability, anorexia. Weight may be normal, but is more often subnormal, or there is a retardation of growth—rarely loss of weight. The musculature is usually flabby, and the posture shows evidence of muscle fatigue. Sweating—not the type known as night sweats, but a tendency to profuse perspiration without apparent cause. Occasionally brief periods of unexplained elevation of temperature above 99.6, but rarely over 100.5. The frequent association of phlyctenular keratitis or conjunctivitis, scrofuloderma and lupus are always to be kept in mind.
>
> PHYSICAL SIGNS
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> Percussion—Paravertebral dullness—the impaired resonance is found between the scapulæ and often extends upward to the supraspinous fossæ. Parasternal dullness This is most frequently found at the right of the sternum and may be erroneously interpreted as due to an enlarged heart.
>
> Auscultation—Voice and breath sounds are usually normal. Râles are rarely found and when present are usually due to some other cause than tuberculosis.
>
> Roentgen Findings—One or more of the following conditions to be present:
>
> 1. Prominent bronchial trunks with definite beaded appearance or nodular in outline, extending from the hilum.
>
> 2. Enlarged lymph nodes, varying in number and density, imbedded in the thickened tissues of the hilum. One or both hila may be involved.
>
> 3. Diffuse shadows of varying density throughout the hilum. Occasionally there are cloudy masses with irregular outlines projecting into the adjacent tissue due to involvement of the deep parenchyma.
>
> Tuberculin Test—The Von Pirquet or intracutaneous test must be positive.
>
> All other sources of toxaemia or infection that could produce similar symptoms must be excluded before a positive diagnosis of hilum tuberculosis can be made.—Henry D. Chadwick, *Boston M. & S. J.* (Dec. 4), 1924.

An Analysis of 368 Reproductive Histories.—The data were collected at random. All cases were rejected in which the husband was not living, and the marriage had lasted less than 15 years. The subjects were working-class women living under rural conditions.

Practically one-half were married between 20 and 25 years of age and over one-half of the pregnancies belong to this age period. There is a marked fall in the number of pregnancies per history in the case of women married after 30.

The sterility rate per 1,000 married women of reproductive age is 16.3. The mean number of pregnancies is 7.3. The rates per 1,000 married women are as follows:

Less than 6 pregnancies.....	312.5
6 pregnancies and less than 11..	486.4
11 pregnancies and over.....	201.1

The mean age at the last pregnancy was 39.2 years and the mean age at marriage of those who became pregnant once only was 29.2. The mean interval between births of successive children varied from 1.7 to 2.9 years, the mean for all births being 2.3 years. The analysis showed no correlation of intervals between births in the same reproductive history.

There were 49 cases of twins and 4 triplets spread over 43 histories, giving rates of 18.2 twin conceptions and 1.5 triplet conceptions per 1,000 pregnancies.

There were 119.3 ante-term "deliveries" per 1,000 conceptions: namely, miscarriages 95.6, and premature births 23.7. More than one-half of the premature births occurred between the seventh and eighth months. Of the prematurely born, 27.8 per cent were stillbirths, 40.3 per cent died before reaching the age of 15 and less than one-third survived to 15 years of age. The miscarriage rate has been estimated at 120–150 per 1,000 conceptions.

The term-deliveries give a mature stillbirth rate of 32.4 per 1,000 conceptions reaching term. The term-deliveries in this series show 94.4 children per 1,000 dying before age 15.

With a view of seeing how far stillbirths, etc., were associated in the same family a coefficient of association was worked out for various combinations, taking all possible pairs, with the following results:

Multiple conceptions with premature births.....	+ .376
Multiple conceptions with stillbirths..	+ .482
Multiple conceptions in the same family.....	+ .166
Ante-term deliveries	+ .236
Stillbirths	+ .358

—*The Med. Off.*, Nov. 8, 1924.

Decreasing Diarrhoea Mortality.—"Probably no one factor is sufficient alone to account for the improvement which has taken place." It is impossible to ignore the house fly, though sanitary improvements such as substitution of water closets for privies and the removal of the decaying foods and garbage have tended to destroy their breeding ground. Furthermore, the better storage and protection of food and the use of such devices as meat safes, muslin covers, etc., compensate in a measure for the absence of a fly-proof larder. Also, food is not so generally exposed to flies and dust in the open shops as formerly. Improvements in the apparatus of bottle feeding for babies have made considerable advances, and the use of the long tube and bottle which cannot effectively be cleaned is now generally a matter of the past.

Credit for this advance must be attributed largely to the educational efforts of medical men and child welfare centers. The use of dried milk has exercised a beneficial influence, especially in cases where even if clean, fresh milk were procurable, there are no adequate facilities for keeping it clean and fresh. "When all these claims have been made and admitted, it has still to be conceded that climate in some way can cause fluctuations in the diarrhea mortality rate, though fluctuations in an upward direction are not so great and disastrous as they used to be."—*Med. Off.* (Nov. 8), 1924.

Diet and Lactation.—Very little research work throws any light on the exact amount of any vitamin essential for the body welfare. Osborn and Mendel, working on rats, have demonstrated that there is a quantitative relation between the vitamin B requirement and the size of the animal. Cowgill's experiments on dogs afford further evidence in support of this statement. The author's experiments indicate that the vitamin B requirement of a lactating animal (rat) is far in excess of non-lactating animals. An excess of protein in a lactating rat's diet leads to the development of abnormal symptoms in the sucklings, and the baby rats rarely survive. The abnormal symptoms can be entirely obviated by adding any food rich in vitamin B to the mother's diet which has been shown as a very important constituent of a lactating rat's diet.

The experiments described prove that a diet may be eminently suitable for growth maintenance, and reproduction, and yet produce harmful results in the sucklings if continued

during lactation, in spite of the fact that the mother rat remains well. In other words, various diets which are excellent for the growing animal may be totally unsuitable for a lactating animal, and in the experiments quoted in this paper, with diets rich in protein, the lactating rat must have a greater supply of vitamin B than at other periods of her existence, otherwise she cannot rear her young successfully. If this be true of human beings, the mother taking a diet with but little more protein than the Atwater standard should include considerable quantities of foods, such as fruits and vegetables, containing vitamin B.—"Vitamin B and Lactation," Gladys Annie Hartwell, *The Lancet*, Nov. 8, 1924.

Inheritance and Tuberculosis.—The following conclusions are based on the analysis of abstracts of histories of approximately 7,500 people, both tuberculous and non-tuberculous, examined during five years, between 1912 and 1916:

More secondary cases of tuberculosis should be expected in families in which one individual has already been attacked than in other families, as the opportunities for infection as well as the living or working conditions are more nearly alike within the same family group.

At Bellevue Dispensary, in New York City, among 1,695 children tested with tuberculin, no greater amount of tuberculosis was found among children with tuberculous parents than among children from normal parents. The reaction was positive in 64 per cent of the first group and in 66 per cent of those in the second group.

Exposure to tuberculosis was found to have been reported more frequently among nontuberculous patients than among those who were tuberculous. Among 2,509 nontuberculous cases 30 per cent gave a history of tuberculosis in one or both of their parents, whereas among 2,785 tuberculous patients only 14 per cent reported a parental history of the disease.

When tuberculosis attacks offsprings from nontuberculous parents, a greater toll is taken than among those descended from tuberculous parents. In the first group the bacillus is implanting itself in virgin soil; in the second, it finds greater resistance. Among 5,852 persons with a negative parental history examined at Bellevue, 59 per cent were found tuberculous; among 1,577 members with a positive parental history, only one-half as many were found tuberculous, namely, 34 per cent.

There is a greater tendency to recovery from tuberculosis in patients descended from tuberculous parents than in individual members of families attacked for the first time. In 118 tuberculous cases with positive parental history, 26 per cent reached a stage of quiescence or arrest of their disease, whereas in 1,059 patients with a negative parental history less than half, or 14 per cent, reached such a condition of arrest or quiescence of their disease.

The almost universal decline of tuberculosis in countries or communities where it was formerly epidemic, and the decreased incidence of this disease in racial stocks that have been exposed longer to urbanization and to tuberculization, have in a measure been due to an increasing immunity acquired by hereditary evolution.

Children of tuberculous parents do not inherit even a predisposition to the disease, but an increasing degree of immunity to it, instead. —Godias J. Drolet, *Amer. Rev. Tub.*, Nov., 1924.

Tuberculosis and Fertility.—A study of tuberculous and non-tuberculous groups in Baltimore shows that any kind of tuberculous mating gives a smaller total absolute number of pregnancies than a non-tuberculous; that is, on the whole, tuberculous parents add less to the bulk of the population than if they were not affected with the disease. Tuberculosis of the mother has a greater influence of the mean number of pregnancies than tuberculosis of the father, statistically speaking. The lower absolute number of offspring, per completed tuberculous family, as compared with the nontuberculous is largely due to early death of the tuberculous; slightly to a greater number of abortions and miscarriages in the tuberculous. The fertility of marriage, however, is enhanced by tuberculosis of either consort. The mating of a tuberculous male with a nontuberculous female shows an increased fertility at all age groups. The tuberculous women married to non-tuberculous men show a higher fertility in all age groups if the age of the husband at death is not taken into consideration. The mating of both parents tuberculous seems to show a higher fertility than the mating of both non-tuberculous.—M. Kacprzak, *Am. J. Hyg.*, 4:605–637 (Nov.), 1924.

Treatment of Goiter.—Treatment by sodium salicylate in general practice at Hockley.

Birmingham, England, has been followed by improvement and cure of thyroid enlargement. The prescription is:

Sod. salicyl. .....gr. x
Sod. bicarb. .....gr. xv
Ammon. carb. .....gr. iij
Mist. menth. pip. .....dr. ss
Sig., t.d.s.

—John W. Duncan, *Brit. M. J.*, Oct. 4, 1924.

Testing the **Eyes of School Children.**—In an analysis of the results of Snellen's eye tests on over 9,000 school children, 6 to 16 years of age, made in South Carolina, Maryland, Delaware, and New York, as to visual acuity, 63 per cent were found to be 10/10 or better in both eyes; 27 per cent were moderately defective; and 10 per cent had rather poor vision—5/10 or less in one or both eyes. The percentage of boys testing normal in both eyes was slightly greater than of the girls. On the other hand the percentage of girls with moderately defective vision was higher than of the boys, but the percentage with poor vision was approximately the same for the two sexes.

The percentage of normal visual acuity in both eyes increased with age, while the percentage with moderately defective vision decreased with age and of markedly defective vision increased markedly with age.

Approximately 89 per cent of the children with poor vision, 5/10 or less in one or both eyes, did not have glasses, although the percentage of children who were wearing glasses increased with age.

From the study there appears to be a strong tendency for visual acuity to be approximately the same in both eyes, but in many cases good vision in one eye is associated with poor vision in the other. There seems to be great tendency for the vision to be the same in both eyes among children with better vision than among those with rather diminished visual acuity.—"Testing of the Eyesight of 12,000 School Children," by Selwyn D. Collins, *Public Health Rep.* (Nov. 28), 1924.

Danger of **Strong Applications in the Prevention and Treatment of Ophthalmia Neonatorium.**—Every year there have been admitted to St. Margaret's Hospital for ophthalmia neonatorum in London two or three cases in which both corneas have been destroyed or very severely damaged by the use, four or five times a day, of perchloride of mercury solution in strengths of 1 in 500 to 1 in 3,000, or by silver nitrate (10 or 20 grains to the ounce) used as drops two or three times a day. These drugs properly applied in correct dilutions are satisfactory, but there is great danger if they are not properly used. Classes of midwives who attend this hospital are taught to use protargol in 10 per cent solutions or acriflavine 1 in 1,500 in castor oil as both safe and effective in the prevention and treatment of the disease.—*Brit. M. J.*, Oct. 25, 1924.

Comparison of Rural with Urban School Children.—In the last annual report of the Lancashire county medical officer the results of a comparison between children attending urban and rural schools were given. The investigation given deals with the last five completed inspections before the war. Strictly speaking, it is not a comparison so much between country and town children as between children attending schools situated between urban and rural districts. In many rural districts there are factories and other conditions which tend to make the life of those who dwell therein approximate to that of town dwellers. The ages selected for study were 5 to 12 years, inclusive; and the method of comparison was that of collecting the percentages of children affected by various diseases or defects. The actual differences found on comparing sex with sex and age with age were very slight, although there appears to be a greater difference between urban 5 year old and rural 5 year old children than in the 12 year group, the advantage being on the side of the rural side at the younger age.

Certain defects appear constantly on one side or other at both ages and of both sexes, which, on the urban side, are undernourishment, pediculosis, wearing glasses, and squint, and on the rural side enlarged tonsils. The pediculosis excess in the towns is probably due to the larger schools and greater opportunity for contact. Wearing spectacles is probably due to the greater facilities in urban districts for obtaining glasses, but the association of increased amount of squint seems to indicate an increased incidence of defective vision among urban children. Enlarged tonsils are commoner among rural school children.—*Med. Off.*, Nov. 15, 1924.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

People We Know in Publicity and Education.—Miss Lelah M. Crabbe of Columbia University has joined the staff of American Child Health Association.

Mrs. E. R. Grant, Educational Secretary, Washington, D. C., Tuberculosis Association, is responsible for securing the photographs of presidents, generals, diplomats and other celebrities which have been used so widely in the Christmas seal campaigns for several years. Mrs. Grant is also chairman of the Modern Health Crusade Committee of the National Tuberculosis Association.

Miss Adelaide McNamara, Division of Exhibits, Bureau of Public Education, New York City Department of Health, advertised the exhibit material offered by the department by a radio talk on Value of Public Health Exhibits.

Mr. James A. Tobey, Chairman of our Health Education and Publicity Section, has resigned as secretary of National Health Council, to give two years to a special study of health legislation. Mr. Tobey will continue at 370 Seventh Ave., New York, N. Y.

Dr. P. P. Jacobs, National Tuberculosis Association, has been decorated by the government of Denmark in recognition of his services to the tuberculosis movement.

Mrs. A. E. Sinks developed a simplified and effective technique of handling the mail sale of Christmas seals as associate of Mr. Sinks when he was director of the Maryland Tuberculosis Association, and has advised and assisted a number of states and cities in working out their mail sale systems during the recent seal campaign.

The 1925 Calendar for Nurses.—Probably not all of your nurses have yet received this very desirable calendar, the theme of which is "Early Schools of Nursing in America." The calendar "contains intimate, interesting bits of history which can not be found elsewhere." National League of Nursing Education, 370 Seventh Ave., New York City. $1.00.

Health Editors "in Conference."—Editors of twenty-one health magazines or organs of health agencies, held a meeting during the convention of the American Public Health Association in Detroit. It was the consensus of opinion that a central source of news was not needed, but that it would be desirable to supply to the general public, through newspapers and popular magazines, a digest of articles and items appearing in the various health bulletins. It was also suggested that on appropriate occasions editors of health periodicals should unite in supporting campaigns sponsored by any of the approved national health agencies. A committee was authorized to draft tentative advertising standards, and another committee to outline a permanent organization for the Editorial Conference Board. Mr. James A. Tobey of the National Health Council was continued temporary chairman, and Mr. B. R. Rickards of the New York State Department of Health was appointed temporary secretary.

Press Copy About Leaflets.—The Children's Bureau has distributed to many daily papers a group of press stories based on a series of popular leaflets recently issued by the bureau: "Why Drink Milk?", "Feeding the Child," "The Care of the Mother," "What Do Growing Children Need?" You may care to ask the Children's Bureau, Washington, D. C., for copies of these press stories to be offered by you to your local papers, or you may find use for the stories in your bulletins to call attention to the leaflets which will be supplied free by the bureau.

Copies of Bulletins Wanted for Class Use.—Mr. George T. Stafford, University of Illinois, Urbana, Ill., would like to receive some weekly or monthly bulletins. "The material contained in the various bulletins will be given to my classes in physical diagnosis in somewhat compact form." Can you send him a few issues of your bulletin, or put him on the mailing list? Mr. Stafford is Associate Member A.P.H.A.

* Please address questions, samples of printed matter, criticism of anything which appears above, etc., to Evart G. Routzahn, 130 East 22d. St., New York City.

How Economic Statistics Won a Health Battle.—A newspaper man tells of his experience in a city of 10,000 population where in 1920 there were more cases of malaria than in all of the remaining population of the state. "State health officials made a survey of conditions and recommended that the ponds be drained, the weeds along the banks cut, and the streams that fed the pools oiled. The city engineer was asked to report on the cost of carrying out these recommendations. He estimated the cost, but in his report included the dogmatic statement that the stagnant ponds had nothing to do with the prevalence of fever in the city and that it was utter nonsense to suppose a mosquito could carry the disease. City council acted on his advice and the situation remained as bad as before." For a year the state report was suppressed. "When the second spring rolled around and it became evident that the municipal authorities intended to do nothing, our newspaper took up the fight and published, among other pertinent articles, the full report of the health department.

"The Chamber of Commerce at once let out a howl: business was injured, industry was damaged, real estate was suffering because manufacturers could not be interested in local sites on account of the low standard of community health. This complaint had some small basis in fact, for one or two factories were moved to healthier locations. It wasn't the newspaper, however, which made them move; it was the menacing condition to which the newspaper pointed. We next went to work on an economic survey which showed how much time employes had lost from work, how much in dollars and cents they had been paid while they were not working, and how much of their absence from work was due to malaria. Then we figured the total amount of money paid out in wages, but unearned because of preventable illnesses. This amount, which represented a clear loss to the employers, would have drained the swamps and oiled the streams many times over. When those facts were published, we got action in a hurry. So far as malaria goes now, that city is healthier than ever before in its history."—Publicity as an Essential in a Public Health Program, Calvert Lewis Estill, *Public Health Nurse*, 370 Seventh Ave., New York, N. Y., 16:568–571 (Nov.), 1924.

How Letters May Help Health Legislation.—"Dear Editor: What can I do to help along good and help defeat poor social legislation? I ask for myself, an average, well-intentioned citizen, and for the small social agency, stronger in good works than in influence, with which I am associated. . . . We are sometimes asked to write a letter to our Assemblyman or State Senator on some pending bill—but that seems rather futile—who in the world would ever read such a letter?—Subscriber." This letter to *Better Times* was answered in part as follows: "Of course no one reads it, dear Subscriber, but do not scorn the simple little individual letter! Far from being futile, letter writing is probably the most effective single instrument by which the individual may bring his weight to bear for or against specific legislation. We have it from a veteran of fifty years' experience with legislatures and their ways, that he has very frequently seen an assemblyman's or senator's vote on a specific measure determined by the bulk of the letters, marked 'For' or 'Against' laid on his desk by his secretary. He has actually seen a Legislature reverse itself on account of the mountain of protesting letters that poured in—the result of a skillfully organized state-wide campaign.

"The letters, always short, need give no reasons for your support of or opposition to specific bills. But they should always have a single bold line right across the top of the page stating the fact of opposition or support with the correct introductory number, Senate or Assembly, according to whom you are addressing your communication to. This makes it easy to count your letter. These letters should go to your Senator, your Assemblyman and to the chairmen of the committees of both chambers to which the bill has been referred. Another way, Subscriber, in which you, as an individual may help is by writing short intelligent letters to the newspapers. Here you should give your reasons for your position, but remember that, however good those reasons may be they must be tersely and succinctly expressed. Brevity is 99 per cent of the secret of getting such letters published. If you do get your letter published—and don't be discouraged at the first failure—send clippings to your state capital." What Can I do to Help? *Better Times*, 100 Gold St., New York, N. Y. (Jan. 5), 1925. 25 cents.

LEGISLATION

JAMES A. TOBEY, LL.B.

The President's Message.—In his message to the 68th Congress, read at the opening of its second session on December 4, President Coolidge made a number of statements which will be of interest to sanitarians. One of these dealt with federal aid to states, the President saying, "For federal aid to states the estimates provide in excess of $109,000,000. These subsidies are prescribed by law. I am convinced that the broadening of this field of activity is detrimental both to federal and state governments. Efficiency of federal operation is impaired as their scope is unduly enlarged. Efficiency of state governments is impaired as they relinquish and turn over to the federal government responsibilities which are rightfully theirs. I am opposed to any expansion of these subsidies. My conviction is they can be curtailed with benefit to both the federal and state governments."

Besides allotments to the states for maternity and infancy care, the federal government also helps finance rural highways, land-grant colleges, and other matters. Mark Sullivan, the political writer, commenting on this topic in the *New York Herald Tribune* for December 3, 1924, said, "While President Coolidge spoke of the sums as 'subsidies,' some others speak of them by the stronger term of 'bribes,' meaning that they stimulate and induce the state governments to spend money and increase taxation." Students of government are, in fact, inclined to question the wisdom of these federal subsidies, though sociologists seem to think that the necessity for action and the results justify the means. The organized medical profession is opposed to the maternity and infancy act, evidently on the grounds that it infringes in some way on their prerogatives. Certainly, sanitarians will agree that expenditure of state funds for the promotion of the public health is a good investment, but whether the stimulus for such appropriation should come from conditional grants from the national government or not may be an open and moot question.

The President also laid much stress on the necessity for reorganization of the federal executive departments. That some practical form of reorganization is essential seems agreed. From the standpoint of public health, however, no really adequate or effective plan for coördination of federal health activities has yet been proposed. The scheme outlined in the reorganization plan for a Department of Education and Relief has many defects.

Department of Education and Relief.—A bill for such a department was introduced in the Senate (S. 3445) at the last session. A similar bill was introduced in the House on December 10, 1924 (H.R. 10273) by Representative Dallinger of Massachusetts. It is understood that this bill embodies the recommendations of the Joint Committee of House and Senate on departmental reorganization, in so far as they relate to education, public health and veteran relief. The purpose of the bill is "to foster and promote public education and health," and the proposed Department of Education and Relief would be vested with jurisdiction and control over:

The Public Health Service
St. Elizabeth's Hospital
Howard University
Freedman's Hospital
Bureau of Pensions
The Federal Board for Vocational Education
The U. S. Veterans' Bureau
The Columbian Institution for the Deaf.

The office of Commissioner of Education is abolished by the terms of this bill, and his duties and powers will be exercised by an Assistant Secretary of Education. The head of the new department will be a member of the Cabinet, with an assistant secretary in charge of public health. There would also be an assistant secretary in charge of Veteran Relief, as the Veterans' Bureau would be taken over. No action is likely. An editorial in the *Journal of the American Medical Association* for December 20, 1924, and another January 10, 1925, strongly condemns this bill as unsound, which is just what it is.

Medical Service of the Veterans' Bureau.—A bill (H.R. 10534) which has for its purpose the improvement of the medical service of the

Veterans' Bureau, has been introduced. It fixes the pay and allowances of doctors in the Veterans' Bureau on a basis equivalent to that of medical officers of the army. At present the tenure of physicians in the Veterans' Bureau is uncertain, and inadequate provisions for salary have not encouraged high grade medical men to enter this service. At the last session of Congress a bill was prepared to meet this situation but failed of passage.

Prohibition and Health.—In a hearing before the Senate Committee on Judiciary, December 18, on the Cramton Bill (H.R. 6645) to create a separate Prohibition Unit in the federal government, severe condemnation was made by Senator Reed of Missouri against the practice of federal officials in placing poison in alcohol so as to make it unfit for beverage purposes. Dr. J. M. Doran, Chief of the Industrial Alcohol Division of the Prohibition Unit, had testified that in his opinion millions of gallons of alcohol are annually used as beverages by the American people, after the alcohol has been denatured. He stated that it was impossible to get all of the poison out of the alcohol and that it had a deleterious effect upon the health of all who drank it and was, in fact, sometimes fatal.

The Cramton Bill passed the House of Representatives at the last session of Congress. Since its passage by that body protests against it have been made by the National Wholesale Druggists Association and other organizations who charge that the legitimate users of alcohol for industrial purposes will be subject to embarrassment and technical regulations which ought not to apply to legitimate manufacturers. The Anti-Saloon League which is sponsoring the Cramton Bill asserts that under the present system of withdrawal of alcohol for industrial purposes, at least 10 per cent falls into the hands of bootleggers. It is claimed that the establishment of a separate unit in the Treasury Department would remedy, in part, the weakness of the present prohibition laws.

Headquarters for Nurses.—The Committee on Naval Affairs of the House of Representatives has favorably reported a bill (H.R. 10685) to extend the nurses' headquarters at the Naval Hospital, Washington, D. C., and at a large number of naval hospitals in various parts of the country. The bill is intended to make clear and specific the terms of the existing law on this general subject. The money made available for the various nurses' headquarters will be part of the Naval Hospital Fund, which fund is made up of a special tax on officers, seamen and marines of the navy. It will provide an expenditure of $75,000 at the Naval Hospital, Washington, D. C., for the extension of nurses' headquarters; for the hospital plant at League Island, Pennsylvania $50,000; and for numerous other naval hospitals sums are also made available.

Other Health Bills in Congress.—A bill (S. 3668) has been introduced for additional hospital facilities for the Public Health Service at New Orleans. The construction of a modern hospital is provided for in the measure, to be erected at a cost of $3,000,000 and equipped to care for six hundred patients.

The Treasury Department, on December 17, sent a formal communication to Congress in which request is made for the immediate appropriation of $275,000 for controlling a reported outbreak of bubonic plague at New Orleans, La. Request is made upon information secured by the U. S. Public Health Service.

A station for investigation of mentally handicapped children in the schools would be established in the Bureau of Education by H.R. 10407.

A bill (S. 3517) to prevent and regulate the sale of imitated or misbranded articles of commerce has been introduced by Senator Ladd.

The International Narcotic Education Association has stimulated the introduction of a concurrent resolution (H. Con. Res. 34) to authorize the government to print twenty-five million copies of an eight-page article prepared by the Association. This modest request will probably not be granted.

The National Conference of Outdoor Recreation has sent out a memorandum calling attention to eight measures which have been endorsed by the executive committee of this organization. These include bills for a migratory bird refuge (H.R. 745, S. 2913); an Alaskan Game Commission bill (S. 2559); a bill authorizing acceptance of private lands for game refugees (S. 3446); the Roosevelt-Sequoia National Park bill (H. R. 4095); and four proposed measures, for national recreational areas, regulation of unappropriated public lands, a national arboretum, and an investigation of the fish situation. These are all indirectly concerned with health.

A Standard Milk Ordinance.—A state-wide milk sanitation program for Alabama is outlined in the *Public Health Reports* for November 7, 1924, by Leslie C. Frank, Associate Sanitary Engineer of the United States Public Health Service. Besides being an excellent report on this significant subject, this article contains the text of a very well drafted standard milk ordinance, which cities have been encouraged to pass and, what is equally important, enforce. The author states that there are three general types of milk ordinance now in use in this country; one requiring all milk to be pasteurized; another dividing milk into two classes, raw and pasteurized, but not grading either; and a third dividing milk into two classes, raw and pasteurized, and providing for a number of grades in each class. A modification of the third type was selected. It recommends that all communities require all raw grades of milk to be pasteurized, but, if this is impossible, to limit the sale of raw milk to grade "A." The author considers this type of ordinance best because "it will through competition result in the production of a high-grade raw supply; because it will result in the maximum percentage of pasteurization; because it will encourage the consumption of milk; and because it will usually meet the approval of the dairy industry."

Some pertinent remarks are made anent methods of promoting the adoption of the ordinance. Experience has revealed that it is unwise to ignore the dairy industry in securing the passage of milk legislation, but it is unwise to make enactment dependent upon their favorable vote. It is wise to acquaint them at the outset with the attitude of the health department on pasteurization, and it is unwise to begin the development of favorable public opinion before informally discussing the proposed ordinance with the city authorities. There are words of wisdom here, applicable to health ordinances in general. The advice given ought to be obvious, but unfortunately it seems seldom if ever to have been.

Course in Public Health Law.—A course of twelve hours instruction in public health law will be given during the second term in connection with the public health courses at the Yale School of Medicine. This course will be conducted by the associate editor, who is also lecturer on this subject at Columbia and the Massachusetts Institute of Technology.

Children's Laws in Montana.—A manual of the laws of Montana relating to children has been issued (July, 1924) by the Child Welfare Division of the State Board of Health. The outline for an index of child welfare legislation suggested by the United States Children's Bureau (in its Bureau Publication No. 131) is followed in the arrangement. Some of the laws are given verbatim, while for others only a digest is presented. Chapter IV is devoted to health and sanitation and seems to indicate the existence of many excellent laws on this subject.

Rhode Island issued in 1923 a study of certain laws and conditions affecting children, and Minnesota published in the same year a compilation of laws relating to children. There are probably other similar bulletins, which we should appreciate having called to our attention.

Legal Measures in Social Hygiene.—A special bulletin to members sent out by the American Social Hygiene Association gives a résumé of some of the activities of the department of legal measures during 1924. Surveys of social hygiene legislation were made in the 11 states whose legislatures met that year and constructive legislation suggested. Investigations of vice conditions were made in 90 municipalities throughout the country, at the request of local official or voluntary agencies. A series of studies of "morals" courts in Philadelphia, Boston, Chicago, and New York was made in coöperation with the Bureau of Social Hygiene. A study of vice repressive laws in 10 states was made and coöperation rendered in the prevention of international traffic in women.

The Health of Indians.—Because there was an increase of 2,599 in the Indian population during 1923, the Secretary of the Interior, who is a physician, believes that the Indians are becoming healthier. In his annual report, the secretary states that health activities are now being centered against trachoma and tuberculosis. A division of field welfare has been added to the service under the direction of a public health nurse. It will be recalled that Congress authorized at its last session increases in the compensation of physicians in the Indian Medical Service. This, it is said, has increased their morale. It usually does.

A number of organizations, notably the American Indian Defense Association, of

which Mr. John Collier is secretary, do not seem to be convinced of the salubrity of our Indian wards and are, in fact, rather ardent in denouncing the lack of health care afforded them by the government. An impartial survey of the health of the American Indian by an organization such as the National Health Council has been proposed and may some day materialize. It is needed.

CONVENTIONS

This calendar is published through the coöperation of the National Health Council, 370 Seventh Avenue, New York City. The Council will be glad to answer promptly any written or telegraphic inquiries regarding meeting dates in order to avoid conflicts.

February 2, American Heart Association, New York, N. Y.

February 22–27, Department of Superintendence of the National Education Association of the United States, Cincinnati, Ohio.

February 26–28, National Association of Deans of Women, Cincinnati, Ohio.

March 9–11, Council on Medical Education and Hospitals, A.M.A., Chicago, Ill.

April 13, National Convention on Prisons and Prison Labor, New York City.

April 18–24, Camp Fire Girls, Chicago, Ill.

April 20–24, American Institute of Architects, New York City.

April 27, American Congress on International Medicine, Washington, D. C.

April 27, American Water Works Association, Louisville, Ky.

April 27–May 2, National Congress of Mothers and Parent-Teacher Associations, Austin, Texas.

April 28–30, Medical and Chirurgical Faculty of Maryland, Baltimore, Md.

May 4, American Society of Clinical Investigation, Washington, D. C.

May 4–5, American Climatological and Clinical Association, Washington, D. C.

May 4–6, American Gynecological Society, Washington, D. C.

May 4–6, American Pediatric Society, Washington, D. C.

May 4–6, American Surgical Association, Washington, D. C.

May 4–9, New England Health Institute, Portland, Maine.

May 5, American Gastro-Enterological Association, Atlantic City, N. J.

May 5–6, Congress of American Physicians and Surgeons, Washington, D. C.

May 5–6, American Society of Tropical Medicine, Washington, D. C.

May 5–6, American Orthopedic Association, Washington, D. C.

May 5–6, American Ophthalmological Society, Washington, D. C.

May 5–7, American Association of Physicians, Washington, D. C.

May 5–7, American Neurological Association, Washington, D. C.

May 8–11, American Association for the Study of the Feeble-Minded, Raleigh, N. C.

May 12–15, American Psychiatric Association, Richmond, Va.

May 15–16, American Academy of Political and Social Science, Philadelphia, Pa.

May 21–22, American Therapeutic Society, Atlantic City, N. J.

May 25–26, American Association of Medical Milk Commissions, Atlantic City, N. J.

May 25–28, American Association of Anesthetists, Atlantic City, N. J.

May 25–29, American Medical Association, Atlantic City, N. J.

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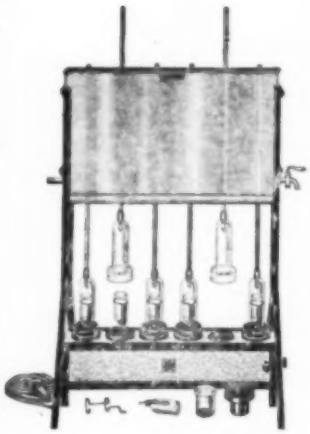

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Supplement to the American Journal of Public Health for February 1925

SCARLET FEVER, DIPHTHERIA AND MEASLES

AT

WILLARD PARKER HOSPITAL, NEW YORK CITY

1919–1923

A Study Carried Out at the Request of the Medical Board of the Hospital

BY

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EDITOR'S NOTE

NO PUBLIC service institution has a right to keep its experience to itself if in any way the records of human life and death can be used to improve the quality of care either under health departments or at the hands of the private practitioner of medicine.

The annual traffic of infected individuals through the wards of Willard Parker Hospital is of interest to health officers and hospital administrators everywhere, not only because it is the heaviest in the country but because for two generations this stream of preventable disease has been studied earnestly by clinicians and bacteriologists and often with good results.

If case records are to justify the time and worry which they cost, some one must use them in a way to reveal their hidden composite story.

In this study by Emerson and Hopping we have an application of a statistical method to a hospital population movement over a five-year period where the age, sex, case mortality, secondary infections, sequelae, duration of care, per capita nursing provision, and causes of death of 16,436 scarlet fever, diphtheria and measles patients are analyzed out of the original case histories of Willard Parker Hospital.

A summary of this report was given at the Detroit meeting of the Association. It is presented here in full with a view to guiding administrative health policies and the improvement of the technique of isolation as well as to stimulate medical boards and executives of hospitals to look at their work in bulk with at least the same critical interest as they apply in the diagnosis of the individual patient.

Changes in hospital procedure following this report have apparently been responsible for a marked improvement in end results of care during 1924, a brief record of which is promised early this year.

This is the full report, an abstract of which was presented before the Public Health Administration Section of the American Public Health Association at the Fifty-third Annual Meeting, Detroit, Michigan, October 23, 1924, under the title Hospital Mortality, Secondary Infection and Complications in Scarlet Fever, Diphtheria and Measles, as a Means of Improving the Medical Technique of Isolation.

INTRODUCTORY

THERE is presented herewith a report of the experience of the Willard Parker Hospital in the care of scarlet fever, diphtheria and measles during the past five years ending December 31, 1923.

The object of the study has been, from the beginning, to obtain a basis for such comparison of results in the care of patients at Willard Parker Hospital as may be helpful in determining improvements in hospital practice and medical treatment of the sick.

The report includes eight main topics for which description and supporting tables, illustrative charts and diagrams will be found in the text, as follows: (a) Case Mortality. This presents the experience of the Hospital with 16,436 patients, classified so that the mortality of each disease can be studied for the entire period of five years, as well as by month, by year, and by age and sex of the patients.

(b) Secondary Infections, due to exposure before or after admission.* Under this heading there are presented the records of the hospital with regard to incidence of infections with the specific communicable diseases, whether acquired from exposure preceding admission to the hospital, or evidently the results of exposure subsequent to admission.

(c) Complicating infections and sequellæ. Under this title, consideration is given to the incidence of complications such as broncho-pneumonia, otitis media, mastoiditis, adenitis, albuminuria and nephritis, etc., according to year, month, age and sex of the patient, and according to the time of onset or occurrence of the complication for the particular communicable disease under treatment.

(d) Intubations in diphtheria. The five years experience with intubations in diphtheria have been studied to show the mortality per cent by year and month, and the relation of intubations to total admissions for diphtheria.

(e) Days care per patient. Under this heading will be found an analysis of the average length of care provided for patients in the hospital according to year, disease and sex, and also classified according to death or recovery.

(f) Hours of nursing care given to patients. Here will be found a record of the relationship between case mortality in the different diseases and the hours of nursing service per patient per day at the different seasons of the year and for patients of different ages.

(g) Causes of death. Analysis of the primary and contributing causes of death among patients admitted for one of the specific communicable diseases.

(h) Comparison with experience in other cities. Here will be found a discussion of similar data so far as they could

* The terms used in this report will be as defined below:

Primary Infection: By this is meant the specific acute communicable disease for which the patient was brought under hospital care.

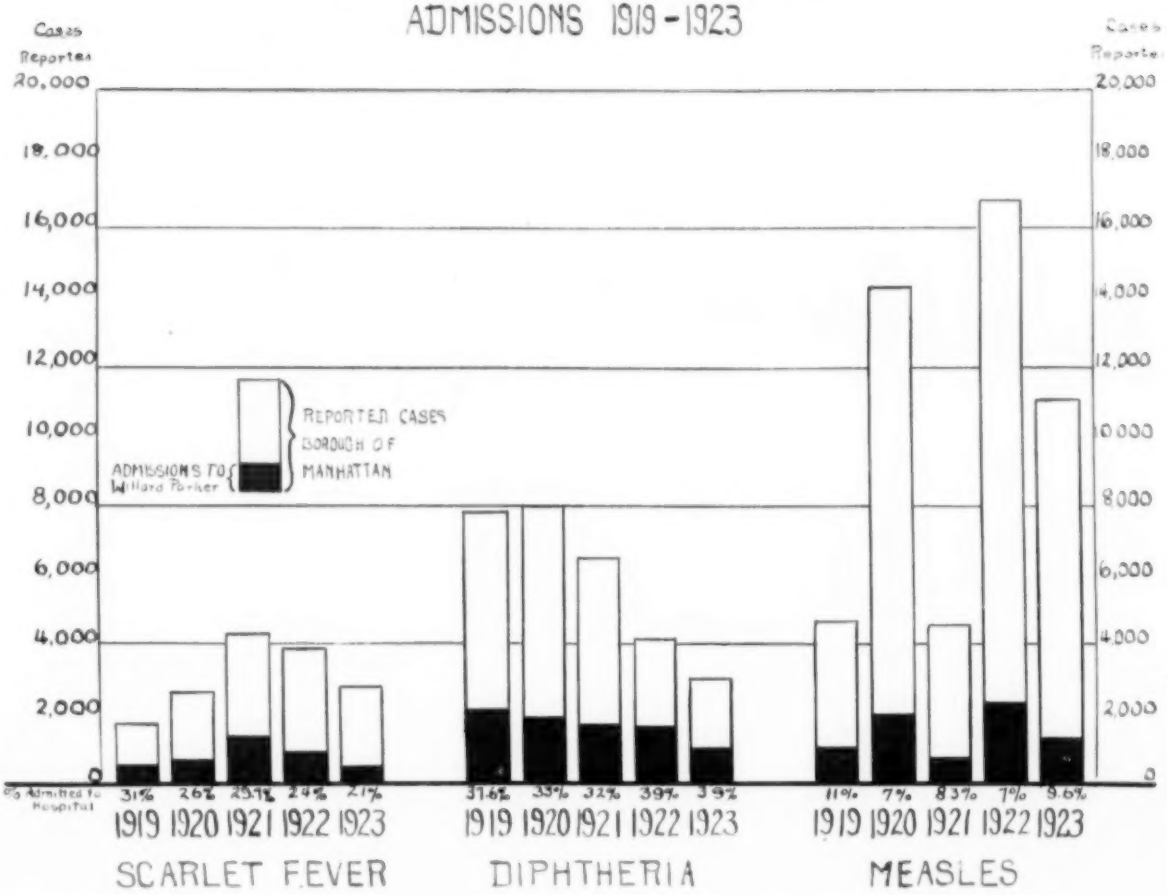
Secondary Infection: By this is meant a specific acute communicable disease developing after admission of the patient to the hospital for another of the communicable diseases. These may be separated into two groups: (a) those acquired from exposure prior to admission to the hospital, and (b) those acquired as a result of exposure in the hospital, the latter commonly being spoken of as "cross-infections."

Complicating Infection: By this is meant the inflammations, usually of the upper respiratory tract, lungs, lymphatic glands, joints, etc., and bacteriemia due commonly to the streptococcus.

There are recorded in the course of the histories, medical examinations and clinical records of patients, *predisposing conditions* which may or may not have any bearing upon the progress of the disease under immediate consideration, and *additional diseases or defects*, existing prior to or developing during the attack of the primary infection and related to the primary disease only accidentally. Concerning these two groups of medical findings, *i.e.*, predisposing conditions and additional diseases or defects, no discussion or analyses are offered.

CHART 1

REPORTED CASES AND HOSPITAL ADMISSIONS 1919-1923



be obtained from Chicago, London, Buffalo and Providence.

The facts presented were obtained from the hospital records as kept in the course of the regular or usual medical services and administrative procedure.

From Tables 1 and 2, and Chart 1, the variation in disease incidence as reported for the Borough of Manhattan to the Department of Health and in the admissions to the hospital will be seen to follow each other quite closely. In the case of diphtheria alone is there any evidence of consistent and progressive reduction during the years 1919–1923.

TABLE 1

INCIDENCE OF SCARLET FEVER, DIPHTHERIA AND MEASLES AS REPORTED IN THE BOROUGH OF MANHATTAN, 1919–1923

Year	Scarlet Fever	Diphtheria	Measles
1919	1,687	5,898	4,531
1920	2,367	5,979	14,302
1921	4,430	5,587	4,531
1922	3,673	4,246	16,671
1923	2,796	2,914	7,066
Total	14,953	24,624	47,101

TABLE 2

HOSPITAL ADMISSIONS BY DISEASE AND YEAR

Year	Scarlet Fever	Diphtheria	Measles
1919	526	2,208	506
1920	614	1,978	1,006
1921	1,316	1,818	374
1922	895	1,650	1,158
1923	589	1,122	676
Total	3,940	8,776	3,720

TABLE 3

DEATHS FROM SCARLET FEVER, DIPHTHERIA AND MEASLES IN THE BOROUGH OF MANHATTAN, 1919–1923

Year	Scarlet Fever	Diphtheria	Measles
1919	59	520	143
1920	118	426	392
1921	174	310	418
1922	116	365	545
1923	58	190	159
Total	525	1,811	1,357

TABLE 4

PERCENTAGE OF DEATHS IN MANHATTAN OCCURRING AT THE WILLARD PARKER HOSPITAL, 1919–1923

Year	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
1919	52.5	82.0	40.5
1920	63.5	72.1	37.8
1921	65.5	84.0	28.0
1922	64.5	82.0	49.7
1923	46.5	71.0	46.5
1919–1923	61.1	78.5	43.2

TABLE 5

CASE MORTALITY PER CENT IN MANHATTAN, 1919–1923 *

Year	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
1919	3.5	8.8	3.16
1920	4.99	7.73	2.74
1921	3.93	5.55	2.6
1922	3.17	8.6	3.27
1923	2.08	6.5	2.25
1919–1923	3.5	7.35	2.88

* Based upon total reported cases of and deaths from these diseases among residents of Manhattan Borough.

A

CASE MORTALITY

During the five years, 1919–1923 inclusive, there were admitted to the Willard Parker Hospital

3,940 cases of scarlet fever
8,776 cases of diphtheria
3,720 cases of measles

16,436 Total

The case mortality for this five-year period was for

Scarlet fever	8.1 per cent
Diphtheria	16.2 per cent
Measles	15.7 per cent

The total number of cases and the case mortality by year and disease for the five years, 1919–1923, are shown in Table 6.

CASE MORTALITY BY MONTH

The case mortality by month varies widely according to the month of occur-

TABLE 6

CASES AND CASE MORTALITY BY YEAR AND DISEASE, 1919–1923

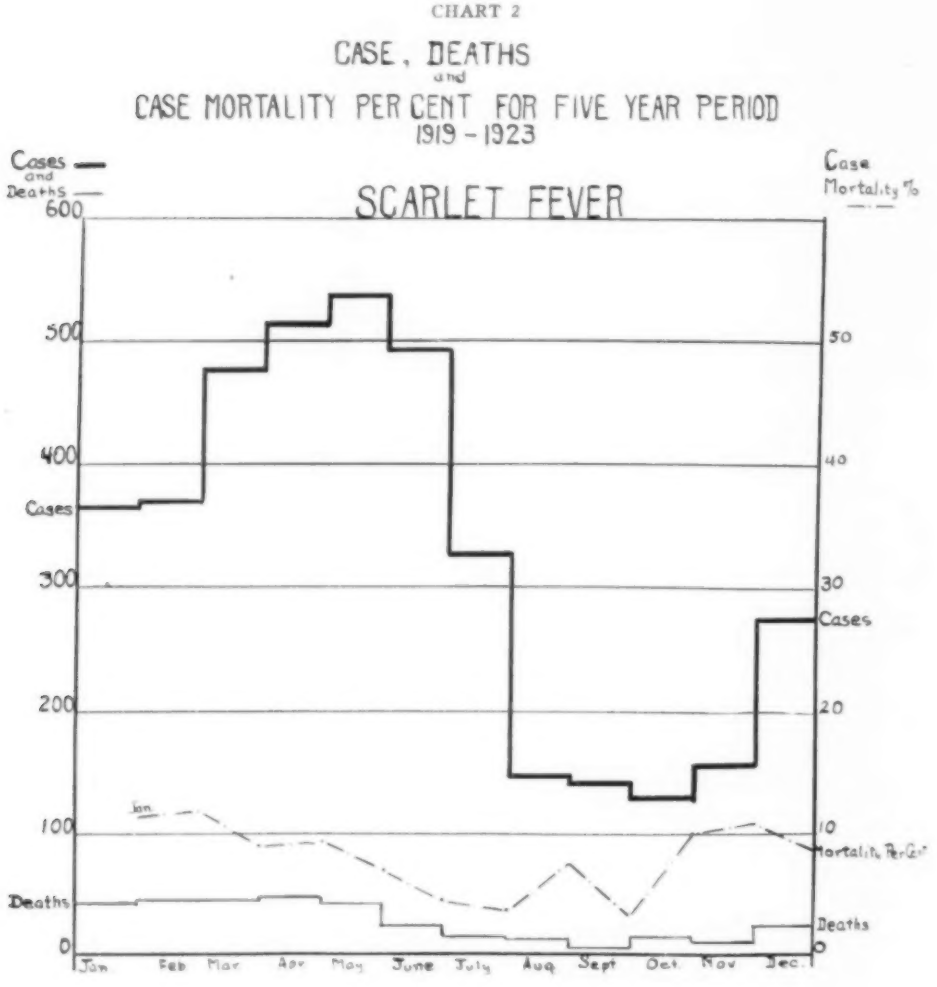
Year	Scarlet Fever Cases	Scarlet Fever Deaths	Scarlet Fever Per Cent	Diphtheria Cases	Diphtheria Deaths	Diphtheria Per Cent	Measles Cases	Measles Deaths	Measles Per Cent
1919	526	31	5.9	2,208	425	19.2	506	58	11.5
1920	614	75	12.0	1,978	308	15.7	1,006	148	14.7
1921	1,316	114	8.4	1,818	260	14.3	374	34	8.8
1922	895	75	8.2	1,650	299	18.1	1,158	269	23.4
1923	589	28	4.6	1,122	135	12.0	676	74	11.0
Total	3,940	323	8.1	8,776	1,427	16.2	3,720	583	15.7

TABLE 7

CASES AND DEATHS FROM SCARLET FEVER, DIPHTHERIA AND MEASLES ARRANGED ACCORDING TO MONTH OF DISCHARGE FROM HOSPITAL, 1919–1923

	Scarlet Fever			Diphtheria			Measles		
	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent	Cases	Deaths	Per Cent
January	368	41	11.1	830	164	19.8	398	80	22.6
February	369	43	11.6	890	227	25.6	395	64	16.3
March	479	43	9.0	983	199	20.2	517	110	21.0
April	516	48	9.3	1,019	184	18.1	523	94	18.0
May	539	41	7.6	1,039	185	17.9	576	92	15.7
June	492	23	4.5	795	104	13.0	455	64	14.0
July	329	14	3.9	693	61	8.8	233	20	8.6
August	146	11	7.5	491	42	8.6	116	6	5.2
September	141	5	3.5	370	44	11.6	73	0	0
October	130	13	10.0	447	36	8.1	54	2	3.7
November	156	17	10.9	578	82	14.2	109	11	10.9
December	275	24	8.7	641	99	15.2	271	40	15.0
Total	3,940	323	8.1	8,776	1,427	16.2	3,720	583	15.7

CHART 2



rence of the disease. The total number of cases and of deaths during the five years 1919–1923 for the different diseases, arranged according to the months of the years are shown in Table 7, and in Charts 2, 3* and 4.

* The figures on which this chart was based did not include 350 cases of diphtheria and croup for 1922.

In each of these three diseases the highest mortality is in the late winter, 12 per cent for scarlet fever in February, and 26 per cent for diphtheria in February, and 23 per cent for measles in January. The low point is in either July, August or September.

From the point of view of hospital administration, the important fact is that the highest number of patients* are in March, April and May with great regularity, in spite of the well known variation in the time of the peaks of epidemic incidence of the diseases in the community from year to year. Highest case mortality percentages are not commonly found in the months of most numerous discharges, but usually two or three months earlier in the year.

The facts in detail stand out more clearly in the separate records of the individual years as shown in Charts, 5, 6† and 7 (prepared from Table A, Appendix) where it will be seen that although it is not uncommon to find the peak of the mortality rate preceding the peak of hospital patients, this is not uniformly the case.

* All the case records reported upon in this study are dated as of the day of termination by death or discharge and not as of the day of admission to hospital care.

MORTALITY BY AGE

The cases have also been arranged in order to indicate the mortality at different ages (Table 8 and Chart 8). Of the cases that are hospitalized the highest mortality is in the age group 7 to 12 months, almost without exception in each disease throughout the five years.

However, the largest number of admissions during the five years, diphtheria and measles, were in the 3–5 year age group, and in the 6–10 year age group in scarlet fever.

† The figures on which this chart was based did not include 350 cases of diphtheria and croup in 1922.

TABLE 8*

CASE MORTALITY IN SCARLET FEVER, DIPHTHERIA AND MEASLES BY AGE AND YEAR EXPRESSED IN PERCENTAGES

Age Group	Mortality Per Cent 1919	1920	1921	1922	1923	Five Years Experience Cases	Deaths	Per Cent
Scarlet Fever								
Under 6 months	50	60	22	0	0	24	6	25
7–12 months	60	67	50	29	60	31	16	50
13–36 months	14	38	19	27	24	261	64	24
3–5 years	7	16	15	11	10	1,001	124	12
6–10 years	3	7	4	6	1	1,254	52	4.1
11–15 years	2	3	4	1	1	456	11	2.4
Over 15 years	0	5	6	9	1	868	38	4.4
Diphtheria								
Under 6 months	33	24	50	25.6	30	173	56	32.4
7–12 months	41	50	48	38.8	34	399	168	42.4
13–36 months	34	33	28	36.8	20	1,766	550	31.2
3–5 years	18	14	14	16.0	12	2,893	441	15.6
6–10 years	9	6	8	7.3	7	1,701	133	7.7
11–15 years	5	3	1	6.5	8	447	15	3.4
Over 15 years	2	4	4	4.4	4	1,332	48	3.6
Measles								
Under 6 months	0	38	7	42	40	80	29	36.4
7–12 months	39	40	21	56	31	297	124	41.7
13–36 months	17	24	20	38	20	1,019	275	27.1
3–5 years	3	8	5	16	3	1,194	105	8.9
6–10 years	12	2	4	6	0	651	27	4.1
11–15 years	18	0	13	0	6	70	4	5.7
Over 15 years	1.6	6	4	0	4	376	12	3.2

* Cases where age was not recorded are given in Table B, Appendix.

TABLE 9

CASE MORTALITY BY SEX AND YEAR

	1919 Per Cent	1920 Per Cent	1921 Per Cent	1922 Per Cent	1923 Per Cent	Total Cases	Deaths	Per Cent
Scarlet Fever								
Male	6.0	13.2	8.8	8.2	5.5	1,874	159	8.5
Female	5.8	11.2	8.5	8.6	3.8	2,066	164	7.9
Diphtheria								
Male	20.8	17.6	13.8	18.6	11.4	4,494	766	17.1
Female	17.6	13.5	14.8	17.4	12.6	4,282	661	15.4
Measles								
Male	8.3	13.0	12.5	25.0	8.8	1,929	295	15.3
Female	15.4	16.5	5.8	21.0	13.2	1,791	288	16.1

CHART 3

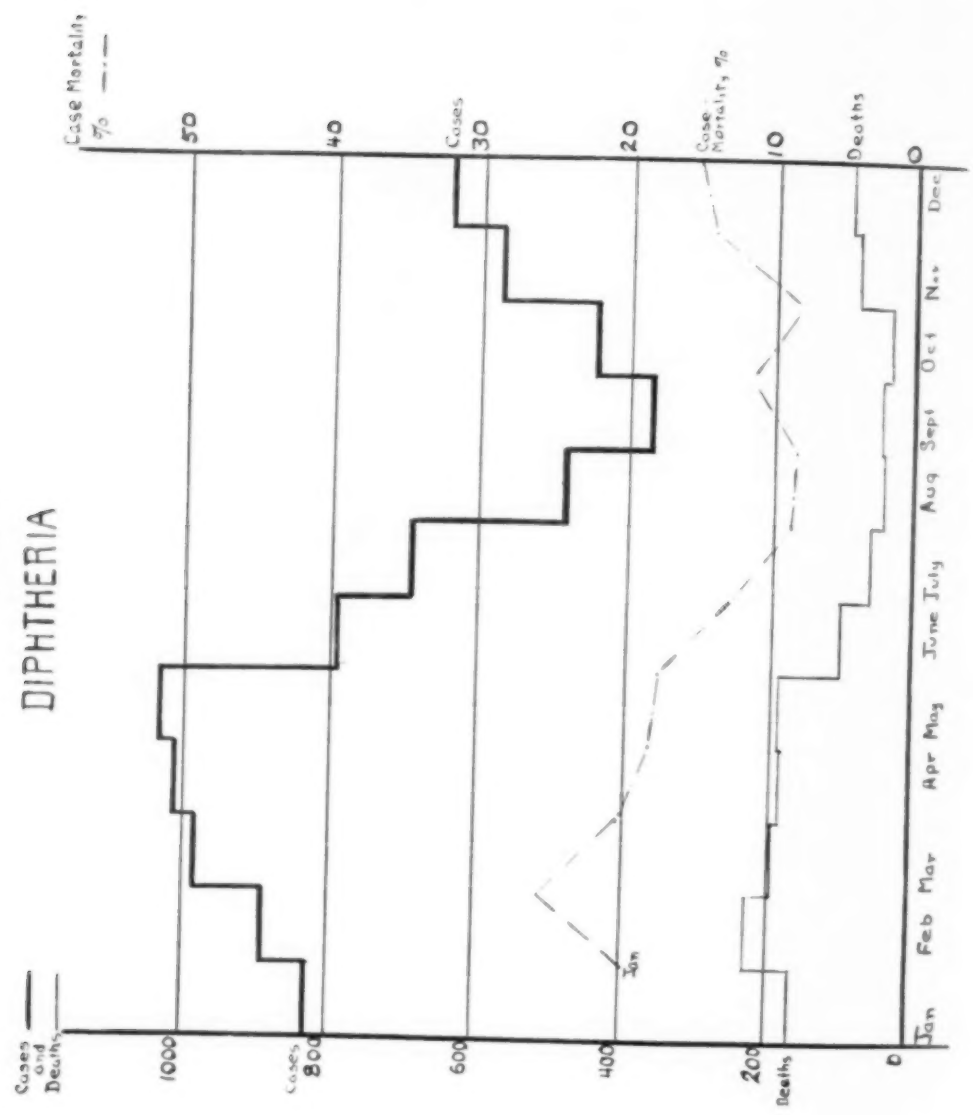

DIPHTHERIA
Cases and Deaths
Case Mortality %
Cases
Deaths
Case Mortality %
1000
800
600
400
200
0
50
40
30
20
10
0
Jan
Jan Feb Mar Apr May June July Aug Sept Oct Nov Dec

CHART 4

MEASLES

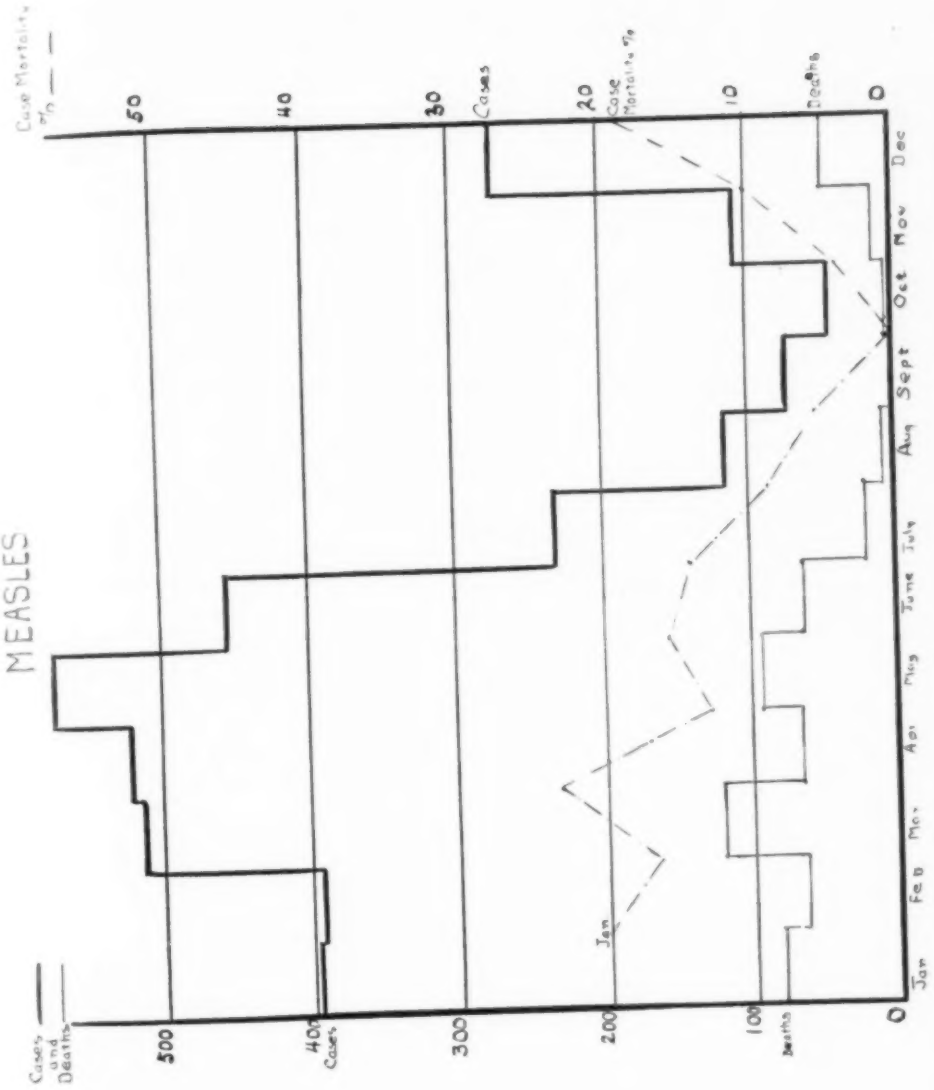


CHART 5
SCARLET FEVER
CHART 5
KEY
CASES
DEATHS
CASE MORTALITY PER CENT
Cases, Deaths, Case Mortality Per Cent
200
150
100
50
0
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1919
1920
1921
1922
1923

CHART 6

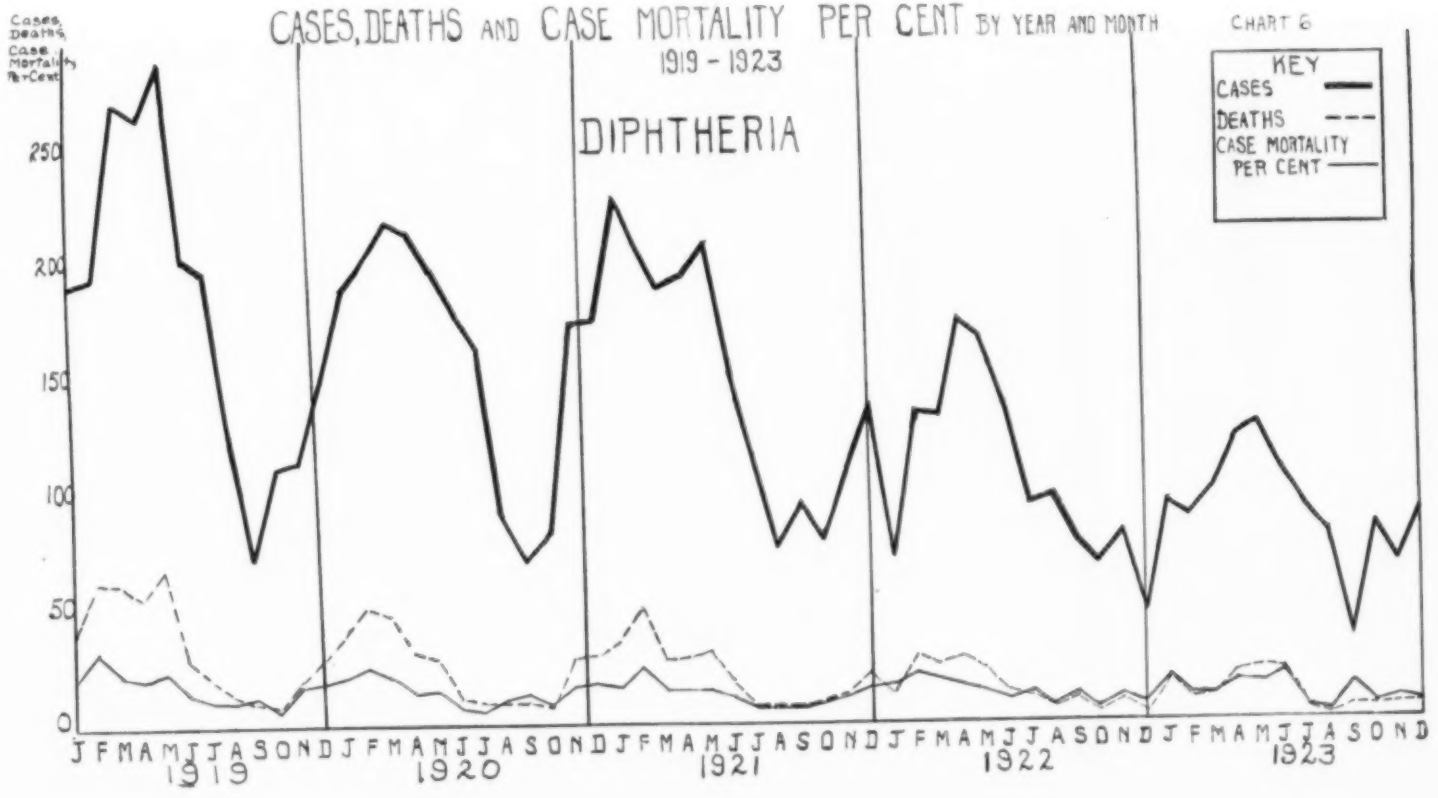

CASES, DEATHS AND CASE MORTALITY PER CENT BY YEAR AND MONTH
1919 - 1923
CHART 6
DIPHTHERIA
KEY
CASES
DEATHS
CASE MORTALITY PER CENT
Cases, Deaths, Case Mortality Per Cent
250
200
150
100
50
0
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1919
1920
1921
1922
1923

CHART 7

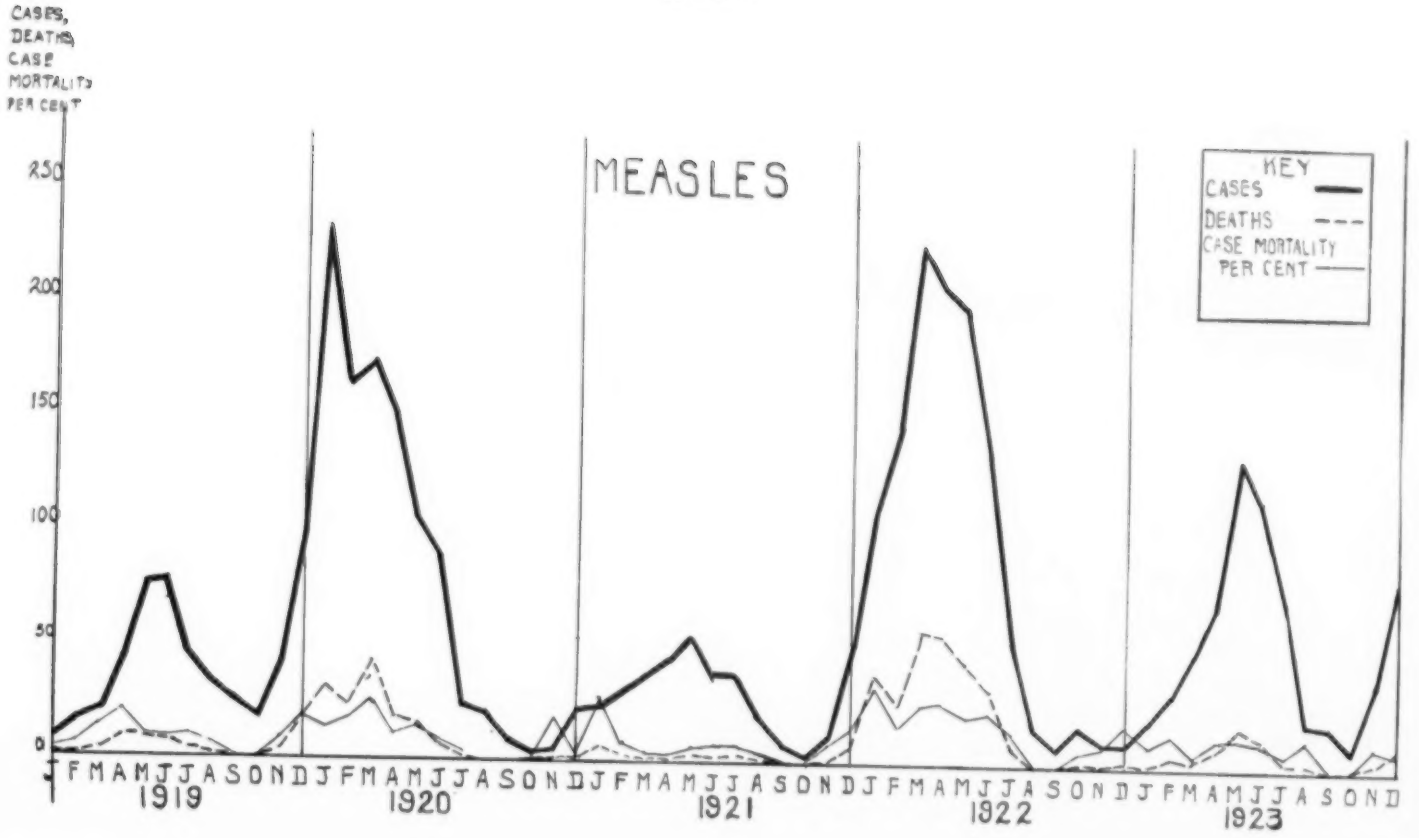
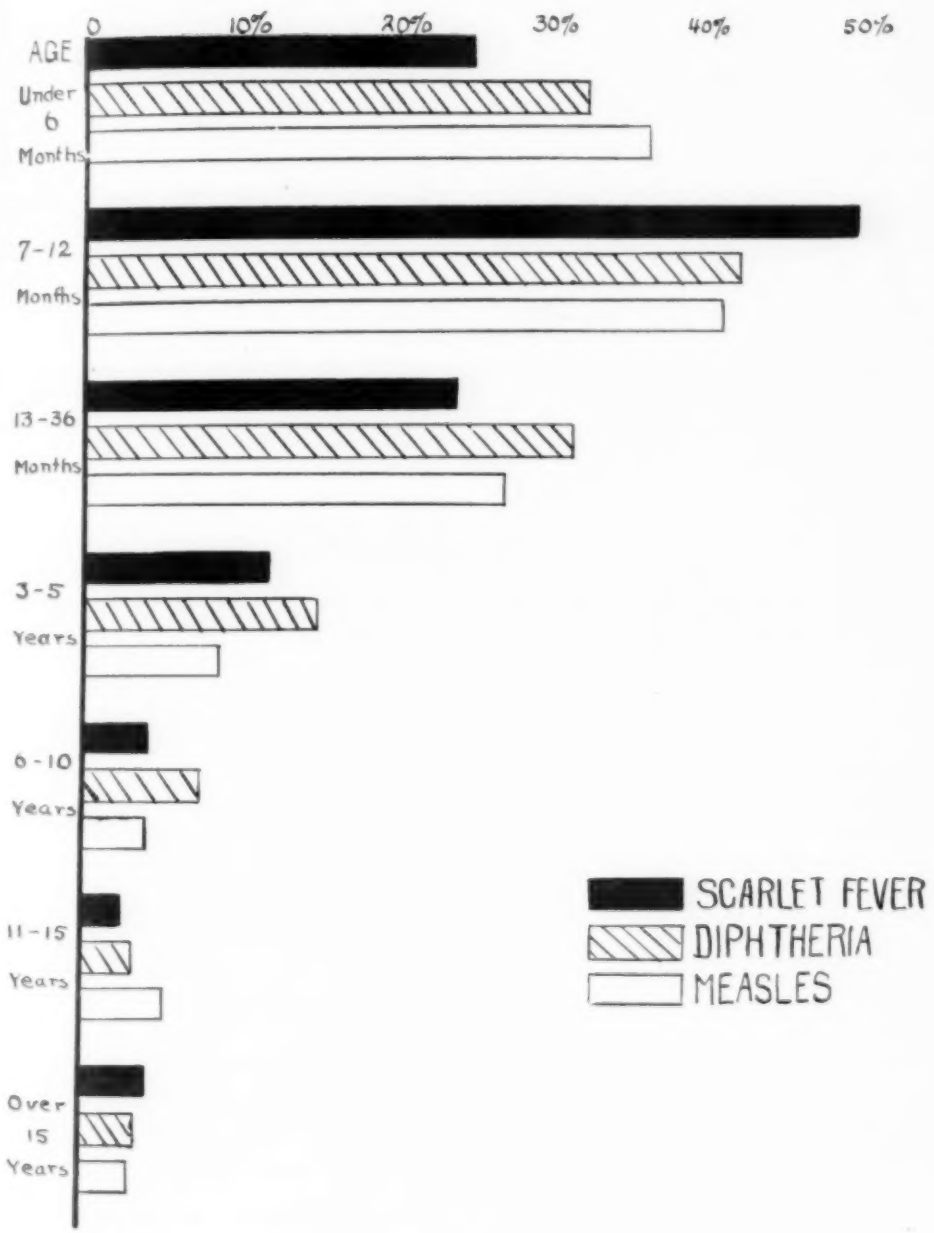

CASES, DEATHS, CASE MORTALITY PER CENT
250
200
150
100
50
0
MEASLES
KEY
CASES
DEATHS
CASE MORTALITY PER CENT
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1919
1920
1921
1922
1923

CHART 8


CASE MORTALITY PER CENT
BY AGES FOR YEARS 1919-1923
0
10%
20%
30%
40%
50%
AGE
Under 6 Months
7-12 Months
13-36 Months
3-5 Years
6-10 Years
11-15 Years
Over 15 Years
SCARLET FEVER
DIPHTHERIA
MEASLES

B

SECONDARY INFECTIONS

The percentage of secondary infections due to exposure prior or subsequent to admission to the hospital, based on total admissions of all three diseases (scarlet fever, diphtheria and measles) was as follows:

	Secondary Infections, 1919–1923	Per Cent of Total Admissions
Due to exposure prior to admission	173	1.05
Due to exposure after admission	241	1.40

If the onset of a secondary infection occurs so soon after admission of the patient to the hospital that the days since admission are less than those of the usual incubation period of the disease it is assumed that the exposure responsible for this infection occurred prior to admission, otherwise the infection is considered to be due to exposure in the hospital.

No records are kept which would permit a conclusion as to whether the secondary infections acquired subsequent to admission to the hospital were due to exposure to patients who were in the incubation period of infections not suspected by the hospital authorities, or were due to the transmission of infectious material by the hospital attendants. This distinction is so important from the point of view of the administration of the hospital that records should be kept to permit of analysis of all secondary infections from this point of view. This has been the practice at the Durand Hospital in Chicago.

The 414 secondary infections (due to exposure prior to and after admission to the hospital) among the 16,436 admissions were of the following diseases:

Secondary Infections	Exposure Before Admission	Exposure After Admission	Total
Scarlet fever	70	24	94
Diphtheria	0	5	5
Measles	48	111	159
Pertussis	5	12	17
Varicella	39	82	121
Parotitis	7	5	12
Rubella	4	2	6

The percentage of patients admitted with one infection who develop a secondary infection due presumably to exposure before admission is a little lower than the percentage of patients who acquire a secondary infection from exposure after admission, and this is true for four of the five years.

TABLE 10

SECONDARY INFECTIONS (DUE TO EXPOSURE BEFORE AND AFTER ADMISSION) BY YEARS, EXPRESSED AS PERCENTAGE OF TOTAL ADMISSIONS

	1919 Per Cent	1920 Per Cent	1921 Per Cent	1922 Per Cent	1923 Per Cent
Secondary infections	0.8	2.3	1.6	3.9	4.2
Exposed before admission	0.2	1.1	0.8	1.7	1.55
Exposed after admission	0.6	1.2	0.8	2.2	2.65

These facts given graphically in Chart 9 show unmistakably the rise in percentage of secondary infections, during the five-year period. In the case of secondary infections, due to exposure after admission, there is an increase of 300 per cent between 1919 and 1923.

The highest percentage of secondary infections, whether due to exposure prior to or subsequent to admission occurs in the 3–5 year age group—49.5 per cent (prior), 58 per cent (subsequent).

TABLE 11

SECONDARY INFECTIONS (PRIOR TO AND AFTER ADMISSION) EXPRESSED AS PERCENTAGES OF ADMISSIONS BY AGE AND YEARS

Year	6 mos.		7–12 mos.		13–36 mos.		3–5 years		6–10 years		Over 10 years	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
1919	0	0	0	.48	.6	.15	.1	1.4	.1	.65	0	0
1920	0	0	1.7	0	1.5	1.9	1.1	2.3	1.5	.1	.1	0
1921	0	0	0	0	1.97	1.4	1.1	1.4	.5	.5	0	.2
1922	0	0	.66	1.3	3.2	1.9	2.6	4.6	1.9	1.9	.4	.14
1923	0	0	.95	.95	2.8	6.6	2.4	3.5	1.4	1.8	.5	.3

CHART 9

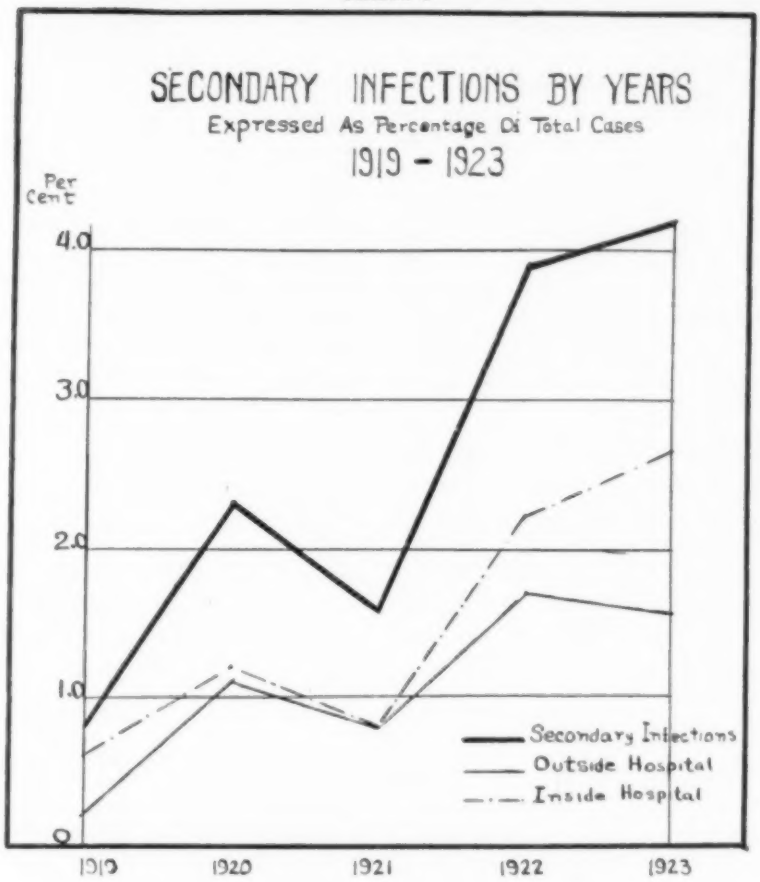


TABLE 12 *

SECONDARY INFECTIONS BY MONTHS AND YEARS (B) BEFORE AND (A) AFTER ADMISSION

Month	1919		1920		1921		1922		1923	
	B	A	B	A	B	A	B	A	B	A
January	0	0	6	15	15	3	18	6	3	3
February	0	0	5	1	1	2	2	15	1	13
March	0	0	5	2	1	7	18	24	1	10
April	0	0	9	0	2	9	15	10	8	10
May	0	0	9	15	3	3	6	7	6	8
June	1	2	0	0	3	3	2	5	1	14
July	0	4	4	7	0	0	1	9	2	5
August	0	1	0	0	0	0	0	2	0	0
September	0	1	0	0	0	0	0	0	0	0
October	0	9	0	0	0	0	0	0	0	0
November	2	2	1	0	1	2	0	1	0	0
December	3	1	2	2	1	1	1	4	0	0
Totals	6	20	41	42	27	30	63	83	22	63

* In the case of 18 of the secondary infections the month of occurrence was uncertain, which accounts for the discrepancy between the totals of Table 12 and those of earlier tables under B.

C

INCIDENCE OF COMPLICATING INFECTIONS

The incidence of complications (adenitis, albuminuria and nephritis, bronchopneumonia and pneumonia, mastoiditis, otitis media) occurring in the period of hospital care of the three communicable diseases, scarlet fever, diphtheria and measles, cannot be briefly summarized. Many other complications were recorded, but in such small numbers as not to warrant their inclusion in this study. There have been compiled the records of all admissions so far as complications existing prior to or after admission to hospital are concerned, according to year, month, age, sex and primary disease, omitting cases where age is not stated on the original record.

TABLE 13

COMPARISON OF COMPLICATIONS IN SCARLET FEVER, DIPHTHERIA AND MEASLES, 1919-1923

	Cases	Complications	Per Cent
Scarlet fever	3,940	2,987	76
Diphtheria	8,776	3,599	41
Measles	3,720	2,688	72

In scarlet fever and measles complications are more frequent than in diphtheria, and their incidence is greatest in scarlet fever. The complications expressed in percentage of total cases for the three diseases for the years 1919–1923 are shown in Table 14.

TABLE 14

PERCENTAGE OF PATIENTS DEVELOPING COMPLICATIONS BY DISEASE AND YEAR *

	1919 Per Cent	1920 Per Cent	1921 Per Cent	1922 Per Cent	1923 Per Cent	Total Per Cent
Scarlet fever	101.0	60.5	69.1	62.4	104.0	76.0
Diphtheria	22.2	25.5	50.5	56.5	70.5	41.5
Measles	60.0	39.4	62.5	74.5	80.0	63.0

* More than one complication was often recorded in the same case which accounts for the high percentages reported.

In scarlet fever, 85.8 per cent of the complications developed after admission, while in measles 68.2 per cent had developed before admission. In diphtheria, as in scarlet fever, complications developed mostly after admission, although not in so high a proportion of cases (Table 15).

TABLE 15

PERCENTAGE OF PATIENTS DEVELOPING COMPLICATIONS BEFORE ADMISSION TO THE HOSPITAL, 1919–23

Year	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
1919	14.8	19.6	61.6
1920	14.1	24.8	60.5
1921	12.4	32.0	51.4
1922	21.5	48.5	77.6
1923	9.9	28.0	38.0
1919–1923	14.2	31.8	61.0

Table 16 shows the nature of the complications in the three diseases. In scarlet fever, albuminuria and infections of the cervical and submaxillary glands represent 80 per cent of the complications. In measles, otitis media, bronchitis and broncho-pneumonia represent about 73 per cent of the total complications. In diphtheria, the most important are albuminuria, 20 per cent, and pneumonia and broncho-pneumonia, 18.5 per cent, and inflammation with swelling of the cervical and submaxillary glands, 36 per cent. These common complications will be analyzed in detail below, by primary disease and by year.

TABLE 16

COMPLICATIONS CLASSIFIED ACCORDING TO VARIETY OF LESION, PRIMARY DISEASE AND YEAR, AND FOR THE FIVE-YEAR PERIOD

Complication	1919	1920	1921	1922	1923	Total	Per Cent
Scarlet Fever							
Otitis media	52	22	56	57	87	274	9.2
Mastoiditis	9	14	35	39	16	113	3.8
Albuminuria	141	156	436	182	228	1,143	38.3
Nephritis	3	3	23	5	19	53	1.8
Bronchitis	2	7	1	8	4	22	0.7
Broncho-pneumonia and pneumonia	11	25	48	32	5	121	4.1
Adenitis	301	138	294	222	243	1,198	39.9
Others (pleurisy, empyema)	3	11	21	9	19	63	2.2
Total	522	376	914	554	621	2,987	100.0
Diphtheria							
Otitis media	1	153	94	82	60	390	10.8
Mastoiditis	2	2	12	13	3	32	.9
Albuminuria	80	62	220	113	250	725	20.2
Nephritis	0	0	6	5	2	13	.4
Myocarditis and endocarditis	4	3	19	60	16	102	2.8
Bronchitis	8	13	35	37	25	118	3.3
Broncho-pneumonia and pneumonia	74	91	161	244	94	664	18.5
Tuberculosis	3	2	3	2	2	12	.3
Adenitis	300	173	275	280	262	1,290	35.8
Tonsilitis	0	0	67	83	62	212	5.8
Paralysis	0	0	4	2	7	13	.3
Others (pleurisy, empyema, vaginitis, pericarditis)	1	6	7	14	..	28	1.1
Total	473	505	903	935	783	3,599	100.0
Measles							
Otitis media	135	205	74	284	169	867	32.2
Mastoiditis	6	19	10	33	17	85	3.2
Albuminuria	15	10	55	25	118	223	8.3
Nephritis	0	1	1	5	2	9	.3
Bronchitis	16	25	24	167	34	266	9.9
Broncho-pneumonia and pneumonia	81	217	71	359	110	838	31.2
Adenitis	100	46	36	77	82	341	12.7
Pleurisy, empyema, etc.	3	5	6	27	10	51	1.9
Tuberculosis	1	2	2	2	1	8	.3
Total	357	530	279	979	543	2,688	100.0

COMPLICATIONS BY DISEASE ON ADMISSION

TABLE 17

PERCENTAGE OF INCIDENCE OF COMPLICATIONS

Age Groups	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
Under 6 months.....	29	35	70
7-12 months	97	48	84
13-36 months	96	50.1	83
3-5 years	102	44.1	60
6-10 years	72	38	46
Over 10 years.....	55	30.6	35
All ages	76	41.5	63

The incidence of complications in diphtheria was much less than in scarlet fever or measles and was more evenly distributed among the various age groups. The greatest percentage of complications in measles occurred in children under three.

At all ages except at 7–12 months complications in scarlet fever developed mainly after admission (Chart 10). In measles complications developed more commonly before admission up to the age of ten years, thereafter the percentage developing after admission was higher. In diphtheria only for children under one year of age did complications developing before admission exceed the percentage of those developing after admission.

TABLE 18

PERCENTAGE OF INCIDENCE OF COMPLICATIONS BY AGE ACCORDING TO RELATION OF ONSET OF COMPLICATION TO DATE OF ADMISSION

Age Group	Scarlet Fever Before Per Cent	Scarlet Fever After Per Cent	Diphtheria Before Per Cent	Diphtheria After Per Cent	Measles Before Per Cent	Measles After Per Cent
Under 6 months.....	29	71	60.6	39.4	73	27
7-12 months	47	53	63	37	72	28
13-36 months	26	74	50	50	66	34
3-5 years	17	84	29.4	70.6	56	44
6-10 years	12	88	20	80	55	45
11-15 years	9	91	15.6	84.4	42	58
Over 15 years	7	93	21	79	44	56

CHART 10

Each of these common complications* will be analyzed by primary disease, by year and month of admission and by age of patient.

*Adenitis, Albuminuria and Nephritis, Broncho-Pneumonia and Pneumonia, Mastoiditis, and Otitis Media.

TABLE 19

ALBUMINURIA AND NEPHRITIS *

Primary Disease	Per Cent of Cases Developing Albuminuria and Nephritis
Scarlet fever	30.6
Diphtheria	8.0
Measles	6.3

* The experience of the five years showed such wide variations in the incidence of albuminuria from year to year and for the different months of the year, apparently due to irregularities in the practice of routine urine analysis that only the records of 1923 by months are offered, since during this year a fairly uniform hospital practice was carried out in this regard. The determination of albuminuria and nephritis was made upon one or both of the following findings, i.e., clinical symptoms, such as subcutaneous edema, or pathological amounts of albumin in the urine.

TABLE 20

PERCENTAGE OF ALBUMINURIA AND NEPHRITIS BY YEAR AND DISEASE

Year	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
1919	27.3	4.3	3.0
1920	25.4	3.1	1.1
1921	24.4	12.6	15.0
1922	20.8	6.8	2.6
1923	41.8	22.4	17.7

The incidence of albuminuria by month in all of the three primary diseases is shown for 1923 in Table 21.

TABLE 21

PERCENTAGE INCIDENCE OF ALBUMINURIA BY MONTH IN SCARLET FEVER, DIPHTHERIA AND MEASLES, 1923

	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
January	25	7	0
February	14	7	6
March	34	36	18
April	72	54	39
May	64	24	25
June	53	19	19
July	27	8	7
August	15	25	5
September	50	21	3
October	55	18	0
November	38	16	8
December	12	21	12

TABLE 22

PERCENTAGE OF NEPHRITIS BY DISEASE AND YEAR

Month	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per cent
1919	1.58	0	0
1920	1.49	0	0
1921	1.59	0.33	0.27
1922	0.56	0.36	0.43
1923	3.2	0.49	0.39

TABLE 23

PERCENTAGE INCIDENCE OF ALBUMINURIA BY MONTH FOR THE THREE PRIMARY DISEASES FOR THE FIVE YEARS, 1919–23

Month	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
January	27	2.9	1.3
February	27	2.4	3.3
March	23	6.4	4.3
April	36	11.5	7.5
May	28	9.3	7.7
June	38	10.4	10.3
July	45	12.9	9.5
August	32	13.8	4.4
September	33	14.6	17.0
October	30	8.0	1.9
November	25	5.5	7.4
December	18	8.2	5.2

2. BRONCHO-PNEUMONIA AND PNEUMONIA

TABLE 24

Primary Disease	Percentage of Cases Developing Broncho-pneumonia and Pneumonia
Scarlet fever	2.9
Diphtheria	7.6
Measles*	22.6

* Much more crowding occurred in the measles wards than in those used for scarlet fever and diphtheria patients.

The incidence of pneumonia as a complication in measles is fairly constant from year to year, lowest in 1919 and highest in 1922, with an average of 22.6 per cent.

TABLE 25

PERCENTAGE OF COMPLICATING PNEUMONIA AND BRONCHO-PNEUMONIA BY YEARS AND DISEASE

Year	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
1919	2.1	3.7	15.4
1920	4.1	4.6	21.8
1921	3.6	8.9	20.0
1922	3.6	14.5	31.0
1923	0.85	8.5	15.2

As would be expected, pneumonia occurs most frequently as a complication in measles in the late winter and early spring. The highest incidence is in March, and the lowest in August, September and October.

TABLE 26

PERCENTAGE OF COMPLICATING BRONCHO-PNEUMONIA AND PNEUMONIA FOR SCARLET FEVER, DIPHTHERIA AND MEASLES, 1919–1923, BY MONTHS OF INCIDENCE

Month	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
January	2.7	6.9	27.0
February	2.5	10.1	25.4
March	2.3	10.4	27.6
April	3.9	8.9	22.2
May	2.8	7.5	23.0
June	2.3	6.3	21.8
July	3.1	5.6	15.1
August	3.4	4.5	16.4
September	2.8	5.1	10.9
October	0.8	5.1	3.7
November	5.1	6.2	12.8
December	3.3	7.6	22.0

Under the age of three, about 40 per cent of the cases of measles are complicated with pneumonia. Above this age the percentage drops steadily.

TABLE 27

PERCENTAGE OF BRONCHO-PNEUMONIA AND PNEUMONIA COMPLICATING SCARLET FEVER, DIPHTHERIA AND MEASLES BY AGE GROUPS, 1919–1923

Age Group	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
Under 6 months	8.4	12.7	39.5
7–12 months	12.9	19.2	39.7
13–36 months	11.8	17.8	37.8
3–5 years	5.0	6.7	17.3
6–10 years	1.8	2.1	12.0
Over 10 years	0.4	0.8	6.9

In both measles and diphtheria, pneumonia had developed mainly before hospitalization.

TABLE 28

PERCENTAGE OF BRONCHO-PNEUMONIA AND PNEUMONIA CASES DEVELOPING BEFORE ADMISSION, 1920–1923 *

Year	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
1920	36.4	55.0	37.5
1921	29.2	80.6	80.5
1922	40.0	83.5	80.5
1923	66.6	81.0	78.0

* These percentages would be more significant if correlated with the duration of disease before admission. This information was not obtained from the hospital records.

3. ADENITIS

TABLE 29

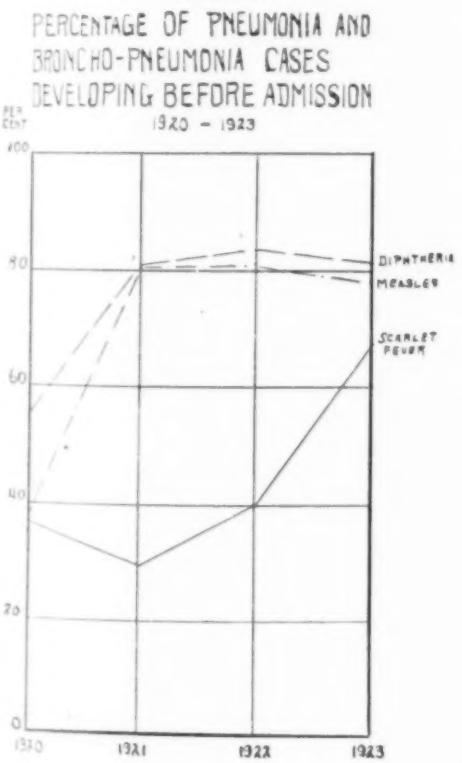
Primary Disease	Percentage of Cases Developing Adenitis
Scarlet fever	30.6
Diphtheria	14.8
Measles	9.3

TABLLE 30

PERCENTAGE OF COMPLICATING ADENITIS BY YEARS AND DISEASE

Year	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
1919	57.2	13.5	19.7
1920	22.5	8.8	4.6
1921	22.4	15.0	9.7
1922	24.9	17.0	6.6
1923	41.4	16.2	12.7

CHART 11



There appears to be no striking seasonal effect in the incidence of adenitis complicating these three primary diseases, except that there is apt to be a slight increase in the summer months.

TABLE 31

PERCENTAGE OF COMPLICATING ADENITIS BY MONTHS—AVERAGE 1919–1923

Month	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
January	33.4	10.4	5.1
February	30.4	13.5	9.0
March	36.2	11.0	9.2
April	28.8	13.4	7.9
May	26.3	10.6	10.3
June	32.0	13.4	14.5
July	33.0	11.0	16.7
August	41.0	14.4	8.0
September	25.7	10.5	14.1
October	26.8	11.4	5.7
November	28.4	11.6	4.6
December	28.8	9.2	2.6

TABLE 32

PENCENTAGE OF COMPLICATING ADENITIS BY DISEASE AND MONTH, 1923

Month	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
January	35.5	23.7	9.4
February	51.0	31.8	9.1
March	39.5	11.6	19.6
April	49.5	39.0	4.6
May	31.3	20.0	9.5
June	39.0	25.9	25.8
July	51.0	13.9	19.4
August	55.0	20.4	9.5
September	16.7	17.9	10.0
October	54.5	17.7	0
November	43.7	21.5	2.6
December	30.7	17.4	0

Adenitis in scarlet fever appears to the greatest extent in children 3 to 5 years old, in measles between 6 months and 5 years.

TABLE 33

PERCENTAGE OF ADENITIS COMPLICATING SCARLET FEVER, DIPHTHERIA AND MEASLES BY AGE GROUPS, 1919–1923

Age Groups	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
Under 6 months	8.3	7.5	5.0
7–12 months	30.0	8.6	10.7
13–36 months	37.0	13.4	9.6
3–5 years	45.4	16.3	10.7
6–10 years	30.0	16.9	8.5
Over 10 years	19.5	13.2	5.6

TABLE 34

PERCENTAGE DISTRIBUTION OF ADENITIS AS CERVICAL OR SUBMAXILLARY INFECTION IN SCARLET FEVER, DIPHTHERIA AND MEASLES

Primary Disease	Cervical Per Cent	Submaxillary Per Cent
Scarlet fever	91	9
Diphtheria	95	5
Measles	85	15

3. OTITIS MEDIA

TABLE 35

Primary Disease	Percentage of Cases Developing Otitis Media
Scarlet fever	13.6
Diphtheria	5.0
Measles	23.6

TABLE 36

PERCENTAGE OF PATIENTS DEVELOPING A COMPLICATING OTITIS MEDIA BY YEAR AND DISEASE, 1919–1923

Year	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
1919	18.2	7.3	27.0
1920	11.4	3.9	20.6
1921	12.5	5.5	19.8
1922	12.6	3.5	25.6
1923	14.8	4.3	25.0

TABLE 37

PERCENTAGE OF PATIENTS DEVELOPING A COMPLICATING OTITIS MEDIA BY DISEASE AND MONTH, 1919–1923

Month	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
January	10.4	3.9	15.5
February	11.5	3.7	24.6
March	14.8	4.9	31.4
April	14.5	5.7	25.1
May	14.6	3.9	25.3
June	12.3	3.5	20.2
July	18.0	3.2	20.6
August	20.6	1.8	19.5
September	12.1	3.5	11.3
October	7.1	1.6	9.4
November	8.4	2.9	3.9
December	14.3	4.4	31.8

TABLE 38

PERCENTAGE OF OTITIS MEDIA COMPLICATING SCARLET FEVER, DIPHTHERIA AND MEASLES BY AGES, 1919–1923

Age Group	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
Under 6 months	12.5	11.0	40.6
7–12 months	26.7	9.6	24.6
13–36 months	25.4	8.4	29.4
3–5 years	23.4	4.1	24.0
6–10 years	11.3	1.6	18.5
Over 10 years	5.8	0.7	12.1

Over 50 per cent of the ear infections in scarlet fever and measles develop after hospitalization. In diphtheria, the proportion of otitis media cases developing after admission shows a steady decrease during the five-year period.

TABLE 39

PERCENTAGE OF COMPLICATING OTITIS MEDIA DEVELOPING AFTER HOSPITALIZATION BY YEARS AND DISEASE

Primary Infection	Year	Percentage Developing After Admission
Scarlet fever—	1919	54.2
	1920	72.2
	1921	67.7
	1922	62.0
	1923	56.4
	Total	63.5
Diphtheria—	1919	97.2
	1920	74.0
	1921	57.7
	1922	43.0
	1923	38.3
	Total	60.5
Measles—	1919	66.0
	1920	71.2
	1921	66.3
	1922	55.0
	1923	52.3
	Total	60.0

4. MASTOIDITIS

TABLE 40

Primary Disease	Percentage of Cases Developing Mastoiditis
Scarlet fever	2.9
Diphtheria	0.4
Measles	2.3

TABLE 41

PERCENTAGE OF COMPLICATING MASTOIDITIS BY YEARS AND DISEASE

Years	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
1919	1.7	0.09	1.2
1920	2.3	0.1	1.9
1921	2.7	0.7	2.7
1922	4.4	1.03	3.0
1923	2.6	0.3	2.5

In each of these three primary diseases, mastoiditis as a complication showed a remarkable and marked increase from 1919 to 1922 (Chart 12). In 1923, however, in each of the three major diseases the percentages of mastoiditis decreased.

In view of the persistent increase in the percentage of mastoiditis complications from 1919 to 1922, it is important to find if there was any change in the ratio between the cases developing before and after admission.

TABLE 42

PERCENTAGE OF MASTOIDITIS DEVELOPING AFTER ADMISSION, BY DISEASE AND YEAR*

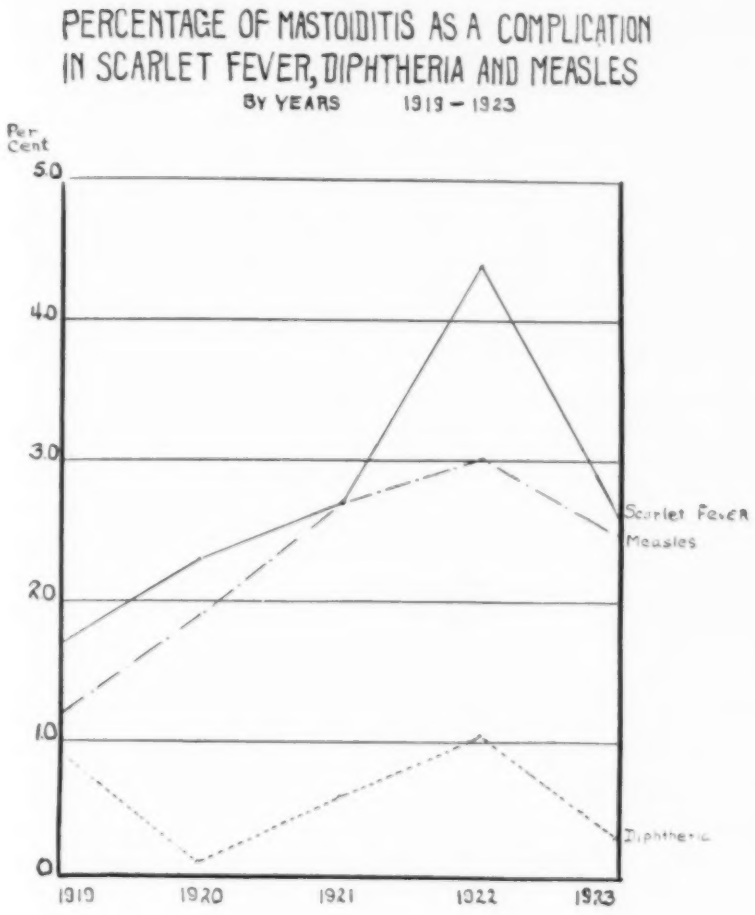
Year	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
1920	64	50	31
1921	77	8	80
1922	77	24	49
1923	57	17	59

* Figures for 1919 are missing from the records.

In scarlet fever from 57 per cent to 77 per cent of the mastoiditis cases developed after admission and whereas the percentage increased up to 1922 there was a fall in 1923.

During 1923 an otologist was detailed to give special attention to severe cases of otitis media that might develop into mastoiditis, on all three services, diphtheria, scarlet fever and measles, with the satisfying result that a marked decrease appeared in the number of mastoiditis cases in the hospital. The same procedure has been carried out in 1924 with an even greater decrease in the first four months of the year.

CHART 12



D

INTUBATIONS IN DIPHTHERIA*

Of the total number of cases of diphtheria (8,776) during the five years, 1,254 or 14.3 per cent were intubated. The intubations on the diphtheria service, with deaths and case mortality per cent, by years, were as follows:

Year	Intubations	Deaths	Per Cent
1919	334	202	60.5
1920	274	151	55.0
1921	280	126	45.0
1922	234	126	54.0
1923	132	54	40.9
Total	1,254	659	52.5

It is possible that the death of the intubated patient may have occurred either during or following the period of intubation. In the latter case, the immediate cause of death may, for instance, have been broncho-pneumonia. The death rates reported here include all patients who were intubated and who later died.

* The figures reported here include cases where tracheotomy was performed.

TABLE 43

PERCENTAGE OF INTUBATED CASES BY YEARS, 1919–1923

Year	Diphtheria Cases	Intubations	Per Cent
1919	2,208	334	15.1
1920	1,978	274	13.8
1921	1,818	280	15.4
1922	1,650	234	14.2
1923	1,122	132	10.1

The introduction in 1923 of the general use of suction as a means of removing diphtheritic membrane and other inflammatory exudate from tonsils, pharynx, larynx, trachea and even the bronchi by

rubber catheter and the Sorenson pump is supposed to have been the chief factor in reducing the percentage of diphtheria patients requiring intubation in 1923.

TABLE 44

CASE MORTALITY RATES OF INTUBATED PATIENTS BY MONTH AND YEARS, 1919–1923 *

Month	1919	1920	1921	1922	1923	Total		
	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Intubations	Deaths	Per Cent
January	53.0	81.0	62.5	55.5	73.5	140	90	64.0
February	84.0	71.0	72.0	84.0	60.0	160	122	76.0
March	100.0	54.0	64.3	100.0	44.0	112	97	86.5
April	69.0	54.0	50.0	74.0	44.0	128	77	60.0
May	62.0	40.0	58.0	59.0	85.0	156	92	59.0
June	65.0	25.0	37.5	46.0	67.0	78	37	47.5
July	24.0	42.0	15.5	52.0	12.5	73	23	31.5
August	6.0	50.0	37.5	33.3	0.0	33	12	36.4
September	25.0	27.0	16.7	33.3	66.0	37	10	27.2
October	8.4	33.0	50.0	33.0	10.0	41	9	21.9
November	65.0	56.0	35.0	42.0	33.0	68	33	48.5
December	54.0	83.0	40.0	50.0	14.0	104	54	52.0

* These figures are exclusive of 124 intubated cases, which were not recorded according to month.

The average number of days during which tubes were worn, irrespective of whether the patient recovered or died were:*

1919	4.6 days
1920	4.6 days
1921	4.6 days
1922	5.4 days
1923	5.8 days
Total	4.9 days

E

DAYS OF CARE PER PATIENT

The average length of stay in the hospital of the patients admitted in each of the five years, irrespective of whether the patient recovered or died, and according to outcome of the case, is shown in the following table:

TABLE 45

AVERAGE LENGTH OF HOSPITAL CARE BY DISEASE AND OUTCOME OF CASE

Disease	Year	Average Days' Care for All Patients	Average Days' Care for Patients Who Recovered	Average Days' Care for Patients Who Died
Scarlet fever—	1919	35.3	35.3	12.6
	1920	32.2	35.2	8.3
	1921	33.6	35.6	10.3
	1922	31.8	33.2	11.7
	1923	35.2	36.0	12.8
	Total	33.2	34.6	10.5
Diphtheria—	1919	17.4	19.8	7.4
	1920	17.4	19.4	7.4
	1921	17.0	18.9	5.3
	1922	15.0	16.8	7.0
	1923	15.4	16.6	7.1
	Total	17.2	18.2	7.3
Measles—	1919	17.4	18.0	13.7
	1920	15.2	15.4	13.8
	1921	17.2	17.8	10.2
	1922	14.0	14.9	10.7
	1923	17.3	18.4	10.0
	Total	15.7	16.4	11.6

* The hospital records did not permit of comparison of experience as to number of days during which tubes were worn, according to the recovery or death of patients.

Apparently the shortening in the duration of care of those diphtheria patients who recovered, which appears to have been consistent throughout the five years, was due in part at least to the earlier use and more adequate dose of diphtheria antitoxin given before admission.

The smaller number of days' care provided for recovering measles patients in 1920 and 1922 was apparently due chiefly to the early discharge of patients in these years of high epidemic incidence with the accompanying heavy demand for hospital care.

The occurrence of many deaths within a few days of admission would give a low average length of stay so the data have been divided to show the average length of stay of the patients who recovered and of those who died. In order to avoid giving a false idea as to the usual duration of hospital care in these communicable diseases, it is proper to divide the patients into two groups, those who recovered and those who died, and report the experience separately for each group. There is nothing in the records of the hospital as to changes in the clinical picture of the diseases from year to year, or the quality of medical and other professional and administrative service which throws any light on the variation in average length of hospital stay of patients.

Comparison of the average length of stay of the patients according to sex shows no significant differences, in the five years' experience:

TABLE 46

Disease	Average Days' Care Male	Female
Scarlet fever	35.3	34.2
Diphtheria	18.3	18.3
Measles	16.2	16.3

An analysis of the average days of care given to patients of various age groups does not show any significant differences among the patients who died, but among those who recovered the average length of hospital care of those one to five years of age was greater, often by 50 per cent than in the other age groups.

TABLE 47

DAYS OF CARE PER PATIENT AMONG THOSE WHO RECOVERED, ACCORDING TO AGE, 1919–1923

Age Group	Scarlet Fever	Diphtheria	Measles
Under 6 months*	20.9	13.7	17.0
7–12 months	49.6	17.2	15.4
13–36 months	46.0	19.2	18.7
3–5 years	42.0	20.0	17.8
6–10 years	35.0	20.2	14.4
Over 10 years	29.0	15.3—	12.4

* Many patients of this age group were admitted on the tenth day of their disease or later, as the minimum period of isolation for scarlet fever was thirty days throughout the five years of this study.

TABLE 48

DAYS OF CARE PER PATIENT AMONG THOSE WHO DIED, ACCORDING TO AGE, 1919–1923

Age Group	Scarlet Fever	Diphtheria	Measles
Under 6 months	14.0	6.7	8.9
7–12 months	12.8	5.7	10.2
13–36 months	9.9	6.8	11.2
3–5 years	10.7	6.8	13.9
6–10 years	10.4	6.8	10.6
Over 10 years	9.9	12.6	16.5

DEATHS WITHIN 48 HOURS OF ADMISSION

As it has been customary to record the deaths according to the interval in hours between the hour and day of admission and the time of death when this occurred within forty-eight hours, the following tables are offered to call attention especially to the seriousness of a situation due in large measure to delay in diagnosis and poor judgment in transferring patients to Willard Parker who are too ill to be moved safely from their place of residence or from other hospitals.

F

RELATION OF NURSING SERVICE TO CASE MORTALITY

In order to arrive at a unit basis of service, *i.e.*, the number of hours of nursing service given to a patient in a day, the total hours of nursing service (day and night) per month has been divided by the number of days in the month and this again by the average daily census of patients in the month.

A study of the charts which represent nursing hours per patient per day for the various months of the year and the case mortality per cent for each disease, brings out the fact that for scarlet fever there is

TABLE 49

DEATHS OCCURRING WITHIN 48 HOURS AFTER ADMISSION, 1919–1923 (Chart 13)

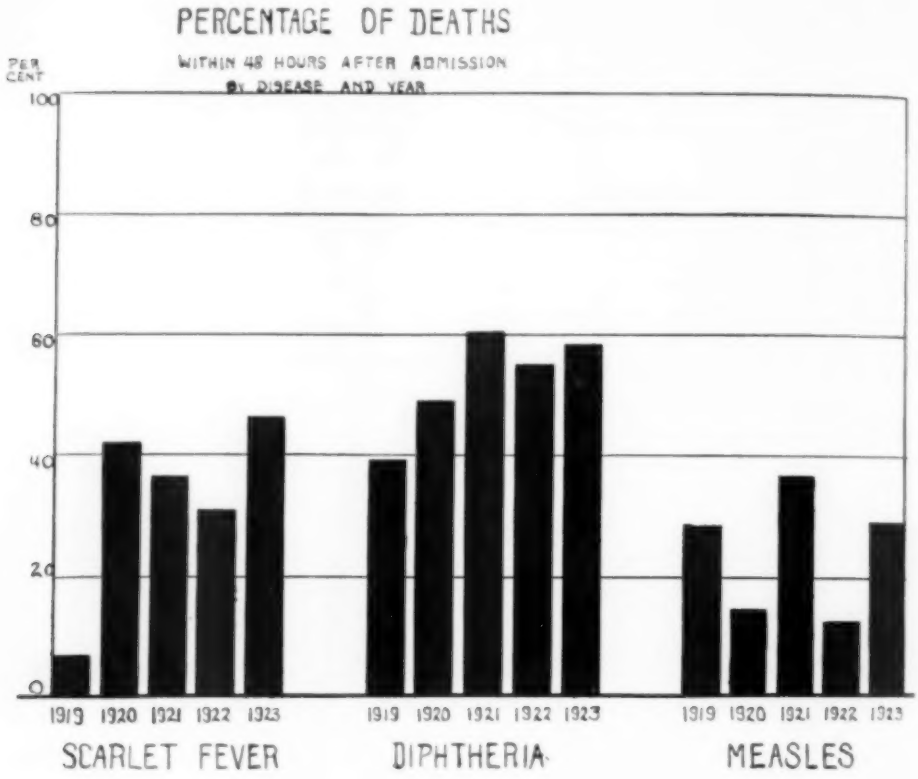
Disease	1919 Per Cent	1920 Per Cent	1921 Per Cent	1922 Per Cent	1923 Per Cent	Total, 5 years Per Cent
Scarlet fever	7.0	42.0	36.5	31.7	46.5	35.0
Diphtheria	39.4	49.5	60.4	55.5	58.3	50.3
Measles	28.8	14.4	36.5	13.5	28.1	18.3

TABLE 50

PERCENTAGE OF DEATHS ACCORDING TO INTERVAL BETWEEN ADMISSION AND DEATH BY YEARS AND DISEASE

Interval	1919 Per Cent	1920 Per Cent	1921 Per Cent	1922 Per Cent	1923 Per Cent	Total, 1919–1923 Per Cent
Scarlet Fever						
Moribund on admission	...	2.7	0.9	2.8	7.1	2.3
Under 12 hours	3.5	16.2	17.3	9.9	10.6	13.6
Under 24 hours	7.0	25.9	26.4	20.9	35.6	23.8
Under 48 hours	7.0	42.0	36.5	31.9	46.5	35.0
Over 48 hours	93.0	58.0	63.5	67.0	53.5	65.0
Diphtheria						
Moribund on admission	1.5	5.5	8.1	4.8	10.4	5.1
Under 12 hours	13.3	21.7	26.6	20.8	22.6	19.9
Under 24 hours	27.8	35.0	42.4	42.6	47.2	36.9
Under 48 hours	39.4	49.5	60.4	55.5	58.3	50.5
Over 48 hours	60.6	50.6	39.6	43.5	41.5	49.5
Measles						
Moribund on admission	1.7	4.1	9.1	0.7	5.4	2.8
Under 12 hours	6.6	6.8	18.2	2.2	9.4	5.5
Under 24 hours	18.5	8.2	27.3	7.8	7.8	20.1
Under 48 hours	28.8	14.4	36.5	13.5	28.0	18.3
Over 48 hours	71.2	84.1	63.5	86.5	72.3	81.8

CHART 13



a noticeable relationship between these two factors. In May, 1920, for example, the high point in the mortality curve corresponds with a low point in the amount of nursing service. Again in December, 1920, and in March, 1922, the high point of the case mortality per cent occurs at the same time as the low point in the number of days of nursing service per patient. In general the high points in quantity of the nursing service correspond with low mortality rates (Charts 14 and 15).

In the main the same relationship appears in diphtheria between the amount of nursing care and the case mortality rate as appeared in scarlet fever. Because of the closing of the measles pavilion for several months each year, the ratio between mortality and nursing service for this disease could not be reliably expressed.

Spacing of Patients

The records of the patients and the location of beds in wards have not been kept with a sufficient uniformity to permit any conclusion as to relationship between square feet of floor space, cubic air space or linear feet of wall space per patient and the incidence of secondary infection or case mortality per cent. Fair conclusions as to the true relation between nursing hours of service per patient and outcome of the case cannot be offered unless the degree of crowding in the wards is considered at the same time.

CHART 14

SCARLET FEVER
RELATION OF CASE MORTALITY PER CENT AND NURSING HOURS PER PATIENT PER DAY FOR 1920, 1921, 1922 BY MONTH

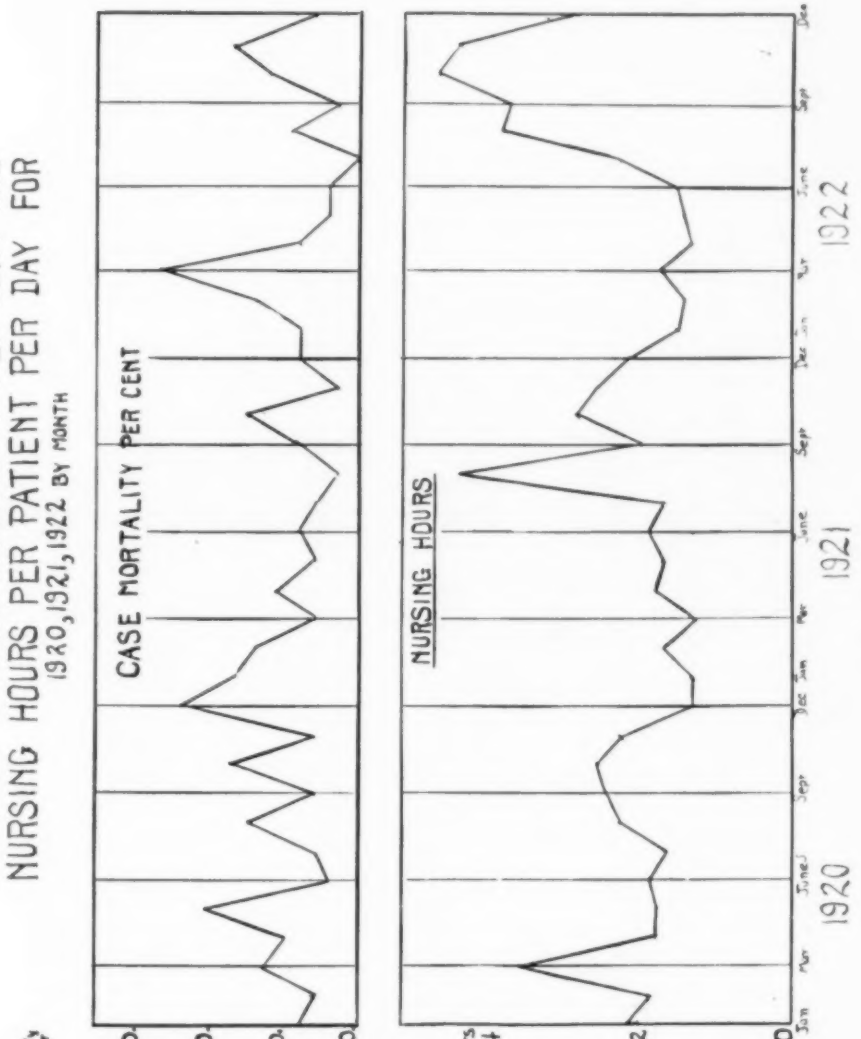


CHART 15

DIPHTHERIA

RELATION OF CASE MORTALITY PER CENT AND NURSING HOURS PER PATIENT PER DAY FOR 1920, 1921, 1922 By Month

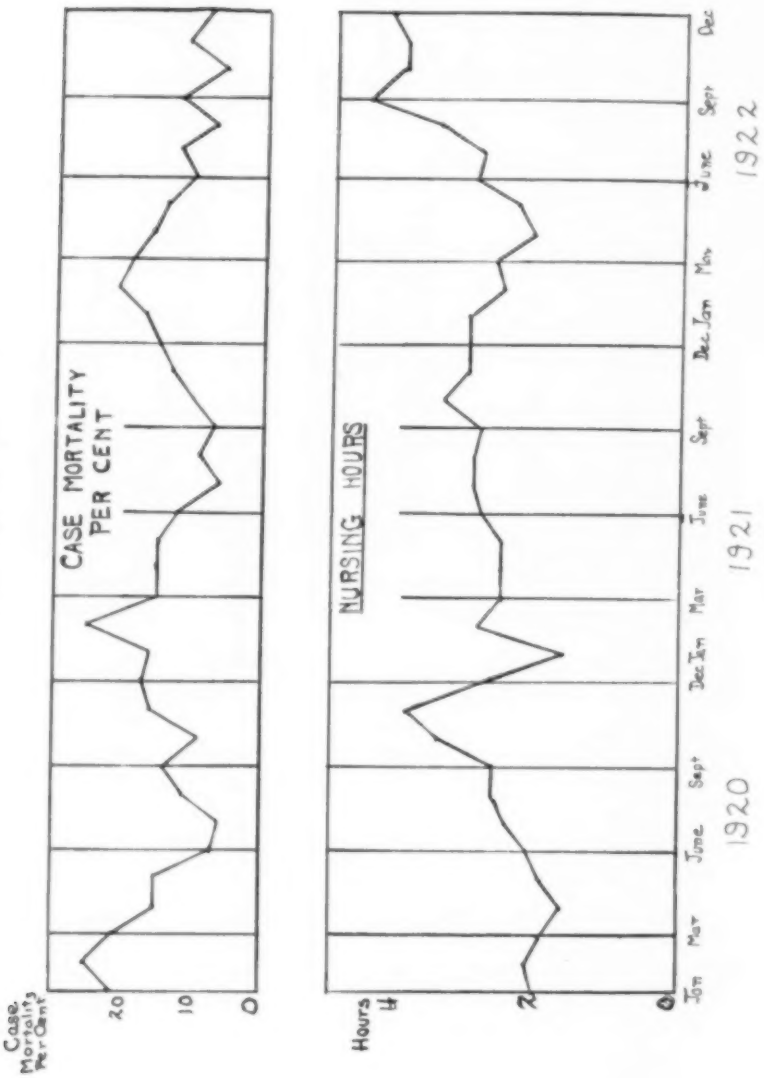


TABLE 51

NURSING HOURS PER PATIENT PER DAY—SCARLET FEVER

Year	Month	Total Number of Hours of Nursing Service per Month	Number of Patients	Nursing Hours per Patient Day
1920	January	2,763	42	2.0
	February	2,439	44	2.0
	March	1,991	17	3.8
	April	2,540	45	1.9
	May	4,535	75	1.9
	June	4,632	78	2.0
	July	3,758	68	1.8
	August	2,763	37	2.4
	September	2,448	32	2.6
	October	2,986	35	2.7
	November	3,982	55	2.4
	December	4,632	103	1.4
1921	January	5,851	130	1.4
	February	8,837	178	1.8
	March	10,156	227	1.4
	April	10,483	175	1.9
	May	7,192	126	1.8
	June	7,192	121	2.0
	July	5,526	96	1.8
	August	3,311	23	4.6
	September	2,215	35	2.1
	October	3,088	33	3.0
	November	2,765	34	2.7
	December	3,758	52	2.3
1922	January	4,530	90	1.6
	February	5,079	122	1.5
	March	7,395	132	1.8
	April	7,070	168	1.4
	May	6,846	146	1.5
	June	6,623	134	1.6
	July	5,526	75	2.4
	August	2,986	24	4.0
	September	2,763	32	2.9
	October	3,535	23	4.9
	November	3,982	29	4.6
	December	4,531	49	3.0

TABLE 52

NURSING HOURS PER PATIENT PER DAY—DIPHTHERIA

Year	Month	Total Number of Hours Nursing Service per Month	Number of Patients	Nursing Hours per Patient Day
1920	January	8,817	132	2.1
	February	8,817	137	2.2
	March	10,686	171	2.0
	April	9,365	180	1.7
	May	9,365	147	2.0
	June	11,356	168	2.2
	July	10,239	134	2.5
	August	9,711	117	2.7
	September	7,577	74	2.7
	October	11,681	108	3.5
	November	13,022	111	3.9
	December	10,361	121	2.8
1921	January	10,259	129	1.7
	February	10,483	129	2.9
	March	10,259	129	2.6
	April	10,036	123	2.6
	May	10,585	130	2.6
	June	8,614	100	2.9
	July	9,041	96	3.0
	August	8,593	92	3.0
	September	6,724	78	2.9
	October	8,146	77	3.4
	November	8,268	89	3.1
	December	9,487	100	3.1
1922	January	8,715	92	3.1
	February	9,041	126	2.6
	March	9,041	106	2.7
	April	8,268	127	2.2
	May	9,040	121	2.4
	June	9,142	103	3.0
	July	8,817	98	2.9
	August	9,366	86	3.5
	September	9,812	73	4.5
	October	9,041	73	4.0
	November	9,488	78	4.0
	December	9,812	75	4.2

G

CAUSES OF DEATH

Analysis of death certificates during the five years' experience showed that few died from the primary communicable disease, but most of the deaths resulted from complications or secondary infections such as sepsis and pneumonia in scarlet fever and diphtheria, and pneumonia in measles.

TABLE 53

PERCENTAGE OF ALL DEATHS SHOWING AS CONTRIBUTORY CAUSES ONE OR MORE COMPLICATIONS OR SECONDARY INFECTIONS; TOTAL OF FIVE YEARS EXPERIENCE, 1919–1923

Complication	Scarlet Fever Per Cent	Diphtheria Per Cent	Measles Per Cent
Sepsis	54.7	21.1	1.6
Broncho-pneumonia and pneumonia	24.2	58.2	90.5
Myocarditis	....	13.2	0.5
Nephritis	2.8	....	....
Mastoiditis	3.1	....	....
Measles	7.5	1.3	....
Meningitis	....	....	2.0
Uncomplicated	1.6	....	0.2
Others (pertussis, tuberculosis, neuritis, otitis media, etc.)	6.2	5.5	5.1
Post-diphtheritic paralysis	....	0.3	....
Multiple neuritis	....	0.4	....
Otitis media	....	....	0.4

TABLE 54

PERCENTAGE OF ALL DEATHS SHOWING AS CONTRIBUTORY CAUSES ONE OR MORE COMPLICATIONS OR SECONDARY INFECTIONS, BY DISEASE AND YEAR, 1919–1923 *

	1919 Per Cent	1920 Per Cent	1921 Per Cent	1922 Per Cent	1923 Per Cent
Scarlet fever					
Sepsis	54.5	63.6	57.0	47.6	45.0
Pneumonia, etc.	24.2	22.7	28.0	21.6	20.6
Mastoiditis	0.0	0.0	1.9	5.7	10.3
Nephritis	6.1	1.5	3.7	2.3	0.0
Measles	0.0	7.6	2.8	17.1	3.4
Others	15.2	3.2	3.7	5.7	17.3
Uncomplicated	0.0	1.5	2.8	0.0	3.4
Diphtheria					
Sepsis	22.2	22.6	24.8	5.6	38.3
Pneumonia, etc.	65.0	59.4	60.1	52.0	40.8
Myocarditis	8.5	11.7	10.2	28.0	9.2
Measles	0.2	2.3	0.0	1.6	2.5
Paralysis	0.5	0.0	0.0	0.8	0.0
Neuritis	0.9	0.0	0.4	0.0	0.0
Scarlet fever	0.2	1.1	4.4	6.8	2.5
Others	2.1	2.8	0.4	5.2	6.7
Measles					
Sepsis	0.0	4.1	0.0	0.4	3.9
Pneumonia and broncho-pneumonia	97.8	92.5	87.7	92.5	84.3
Meningitis	0.0	1.6	2.1	2.6	1.3
Others	2.2	1.7	8.1	4.5	10.5
Uncomplicated	0.0	0.0	2.1	0.0	0.0

* Where two or more complications were reported as causes of death, priority was given according to the arrangement in "Index of Joint Causes of Death." Wash. Govt. Printing Office, 1914.

TABLE 55

CASE MORTALITY PER CENT OF PNEUMONIA, MASTOIDITIS AND NEPHRITIS OCCURRING AS COMPLICATIONS OF SCARLET FEVER, DIPHTHERIA AND MEASLES, 1921–1923

Pneumonia	1921 Per Cent	1922 Per Cent	1923 Per Cent
Scarlet fever	62.5	59.5	100.0
Diphtheria	84.0	53.0	51.6
Measles	60.5	67.5	57.0

Mastoiditis*			
Scarlet fever	5.7	20.5	18.7
Diphtheria	0.0	23.5	0.0
Measles	0.0	30.4	11.8
Nephritis			
Scarlet fever	17.0	40.0	0.0
Diphtheria	0.0	0.0	0.0
Measles	0.0	0.0	0.0

* Differences in figures listed here and those in Table 56 are due to the inclusion here of all cases where mastoiditis was reported as a cause of death, without regard for the preferment given to a possible second complicating infection, as in Table 56.

By reference to Table 41 it will be evident that while the percentage of cases of scarlet fever developing mastoiditis reached a maximum in 1922 and fell in 1923, the mortality rate of the cases that developed was much higher in 1923 than in 1922.

CONDITION ON DISCHARGE

No information is available as to the condition of patients at the time of discharge from the hospital because of the lack of a record of a complete medical examination on this occasion.

H

COMPARISON WITH OTHER HOSPITALS FOR COMMUNICABLE DISEASES

Without a most careful consideration of many accompanying facts no honest comparisons can be drawn as to the character of professional and administrative services in hospitals for communicable diseases in different cities. The following summaries of the experience at Willard Parker Hospital, New York City, at the Durand Hospital, Chicago, the City Hospital at Providence, R. I., the Buffalo City Hospital at Buffalo, N. Y., and the hospitals of the Metropolitan Asylums Board of London are offered without any attempt at expressing comparable data, but with the desire of stimulating critical discussion of the differences shown.

TABLE 56

COMPARATIVE CASE MORTALITY RATES

Disease	Willard Parker 1919-1923 Per Cent	Durand Hospital, Chicago 1913-1922 Per Cent	City Hospital, Providence 1910-1921 Per Cent	Hospitals of Metro. Asylums Board, London 1921 Per Cent
Scarlet fever	8.5	3.7	4.3	1.03
Diphtheria	16.2	9.6	11.8	8.78
Measles	15.8	4.5	7.5	8.44

It is of especial importance to know that while in Manhattan Borough of the City of New York, chiefly contributing admissions to Willard Parker, in 1919 and 1920, only 36.7 per cent and 28.8 per cent of the reported cases of diphtheria were hospitalized, in London 81.8 per cent of the reported cases of diphtheria were hospitalized and a similar situation prevailed with regard to scarlet fever as will appear from the following table:

TABLE 57

New York City, Borough of Manhattan	Diphtheria Cases Reported	Cases Hospitalized* Number	Cases Hospitalized* Per Cent	Scarlet Fever Reported	Cases Hospitalized* Number	Cases Hospitalized* Per Cent
1919	5,898	2,164	36.7	1,687	514	30.6
1920	5,979	1,717	18.8	2,367	656	27.7
London						
1920	16,334	13,369	81.8	32,764	29,806	91.2

* Annual Reports, Board of Health, 1919, 1920.

Of the 14,302 cases of measles reported in Manhattan in 1920, 1,006 were admitted to Willard Parker, or 7 per cent. In London, measles is not a notifiable disease and is rarely admitted to hospital care.

It is obvious that Willard Parker Hospital received the less favorable cases as can be seen from reference to the death rates from these three diseases per 100,000 of the population, of the cities of New York and London in the year 1921.

TABLE 58

DEATH RATES PER 100,000 OF THE POPULATION, 1921

Disease	London	New York City
Scarlet fever	6	7
Diphtheria	25	16
Measles	5	3

These figures cannot be considered as comparable unless the age grouping of these two metropolitan populations are similar, which cannot be positively stated for the years of this study. Furthermore, the wide variations in the incidence of measles from year to year and in different

cities deprives such comparative rates of great reliability.

TABLE 59

CASE MORTALITY RATES BY AGE

Age	Willard Parker Hospital Per Cent	Durand Hospital (Chicago) Per Cent	Providence City Hospital Per Cent
Scarlet fever			
0–5 years	15.9	10.3	9.0
6–10 years	4.1	2.3	2.5
Over 10 years	3.7	1.8	4.3
Diphtheria			
0–5 years	23.2	15.7	21.0
6–10 years	7.7	10.6	10.0
Over 10 years	3.6	2.4	4.8
Measles			
0–5 years	20.6	....	17.5
6–10 years	4.1	....	1.3
Over 10 years	3.6	....	3.9

TABLE 60

SECONDARY INFECTIONS

Percentages of All Admissions Developing Secondary Infections Due to Exposure Before or After Hospitalization

	Providence City Hospital 1910-1921	Willard Parker 1919-1923	Durand Chicago 1913-1922	Buffalo City Hospital* 1920-1923
Exposure before admission	...	1.08	0.84	6.8
Infection in hospital	2.0	1.50	0.84	5.8

* Personal communication from Superintendent.

COMPLICATIONS

Little information could be obtained as to the incidence of complications in these various hospitals, but valuable tables can be had from the report of ten years' experience at the Durand Hospital in Chicago, recently published.

Comparison of the percentage of incidence of some of the more important complications at Durand Hospital and at Willard Parker is shown below:

TABLE 61

Complication	Durand Hospital 1910-1921 Per Cent	Willard Parker 1919-1923 Per Cent
Nephritis in scarlet fever	2.1	1.8
Nephritis in diphtheria	2.1	0.4
Otitis media in scarlet fever	14.5	9.2
Otitis media in diphtheria	....	10.8

It may well be that the differences in the reported incidence of nephritis in diphtheria are due to differences in clinical criteria for diagnosis at the two hospitals.

TABLE 62

INTUBATIONS AND TRACHEOTOMY IN DIPHTHERIA

Case Mortality Per Cent in Intubated Cases of Diphtheria

Year	Metro. Asylums Board Hospitals, London	Durand Hospital, Chicago	Willard Parker, New York City
1909	4.9	....	....
	33.54 (tracheotomy)		
1913	....	33.3	....
1914	....	40.0	....
1915	....	35.0	....
1916	....	52.9	....
1917	....	27.8	....
1918	....	54.4	....
1919	....	55.6	60.5
1920	....	18.7	55.0
1921	44.28 (tracheotomy in primary disease)	14.3	45.0
1922	75.00 (tracheotomy in secondary disease)	29.0	54.0
1923	....	....	40.9

The case mortality percentages of intubated patients must necessarily vary according to the practice of the different hospitals in using this therapeutic resource, which varied considerably as can be seen from the following:

PERCENTAGE OF DIPHTHERIA CASES INTUBATED

Providence City Hospital, Providence, R. I.	Durand Hospital, Chicago	Willard Parker, New York City,
36.5	9.1	14.3

DEATHS AFTER INTUBATIONS AS PERCENTAGES OF TOTAL DEATHS

Durand Hospital Per Cent	Willard Parker Per Cent
30.6	46.0

AVERAGE LENGTH OF USE OF TUBES (IN DAYS) IN INTUBATED PATIENTS

Willard Parker	Providence City Hospital	
Total	Recovered	Died
All Intubated Cases	Intubated Cases	Intubated Cases
4.9 days	8.9 days	3.7 days

TABLE 63

AVERAGE DAYS OF HOSPITAL CARE

	Willard Parker, N. Y. City	City Hospital, Chicago	Metropolitan Asylums Board, London Town Hospital		Conv. Hospital	
	1919–1923	1910–1921	1908	1909	1908	1909
Scarlet fever						
Recovered	34.0	32.9–49.6	64.7	64.5	62.1	62.9
Fatal	10.5	2.0–16.9	....	....	....	....
Total	33.2	31.1–47.0	61.3	61.7	62.2	62.9
Diphtheria						
Recovered	18.2	22.1	56.3	59.0 (31.8)*	72.3	75.7
Fatal	7.0	10.6	....	....	....	....
Total	17.2	20.6	50.8	53.8 (31.7)*	....	....
Measles						
Recovered	16.4	....	....	....	....	....
Fatal	11.6	....	....	....	....	....
Total	15.7	....	....	....	....	....

* Cases proved bacteriologically.

DAYS OF HOSPITAL CARE

The only other hospitals from which a record of the average length of stay of patients was obtained were the City Hospital, of Providence, R. I., and the Metropolitan Asylums Board Hospitals, London.

NURSING SERVICE AND CASE MORTALITY

TABLE 64
NURSING HOURS PER DAY

Disease	Willard Parker	North Eastern Hospital, South Tottenham, England
Scarlet fever	1.5–4.9	2.1–4.8
Diphtheria	1.7–4.5	2.0
Measles and whooping cough	1.5–14.7	2.9

CONDITION ON DISCHARGE

Under this heading there is unfortunately nothing definite which can be offered inasmuch as the records of the Willard Parker Hospital have not been kept with that completeness in regard to this item which is desirable from the point of view of statistical analysis.

As a convenient means of following at a glance the current experience of the hospital and obtaining prompt warning of those sudden changes in the type of virulence of the primary disease and the complications which frequently occur, as well as showing correlation between the amount of nursing service, the hospital census and the incidence of secondary infection, complications or deaths among the patients, three line charts are suggested as routine records for the administrative office of the hospital:

Chart A. Admissions and deaths by primary disease by days.

Chart B. Secondary infections after admission and complicating pneumonias by primary disease by days.

Chart C. Nursing hours per patient per week for the main disease groups cared for.

A summary sheet upon which the significant items for each patient admitted are to be entered at time of discharge or death of the patient, has been prepared for routine hospital records.

SUMMARY

Five years' experience with scarlet fever, diphtheria and measles covering 16,436 hospital admissions has been analyzed to determine if possible a basis for judging of the value of hospital care for these diseases, and to formulate principles of hospital practice which will contribute to (a) a lower mortality from the original or primary infection, (b) a reduction in the incidence of secondary infections, (c) fewer complicating lesions, (d) a shorter period of hospital care.

It appears to be true that periods of crowding and shortage in nursing personnel are commonly accompanied by higher case mortality rates, together with higher incidence of secondary and complicating infections, this experience suggesting the propriety of establishing minimum floor space per patient and maximum patient ratio per nurse expressed in hours of nurse service per patient per day or week.

The deaths and complicating lesions are so commonly due to secondary invaders, chiefly the streptococcus that in addition to separating patients in wards or cubicles according to the primary infection, as great care should be used in separation of patients and in the aseptic medical technique used in their care according to the presence or absence of pneumonia, or other discharging lesions of the respiratory tract and its connecting structures, glands, sinuses, etc.

The death rate among children under two is so high, especially in measles, that it is believed inadvisable to admit such patients to hospital care even when the home conditions are unfavorable, if by visiting nurse service passable conditions can be provided.

The frequency with which deaths occur within the first 48 hours after admission especially from diphtheria and from pneumonia in measles patients indicates the necessity of renewing the education of

physicians in the early and adequate use of diphtheria antitoxin in suspicious cases, and of declining to permit transfers from other institutions in cases of measles where complicating pneumonia has already set in.

The use is recommended of a form of summary record for each admission that will permit of current comparison of results of care and serve as the basis of study by uniform data over a series of years so that the relative usefulness of hospitals for communicable diseases may be determined both for control of disease and for treatment of the sick.

ACKNOWLEDGMENT

The authors appreciate the opportunity offered by the Medical Board of the Willard Parker Hospital, and the Commissioner of Health, to study the hospital records and wish to acknowledge their indebtedness to the officers and staff of the hospital for their uniform courtesy and helpfulness in making available all useful information in their possession.

APPENDIX

TABLE A

CASES, DEATHS AND CASE MORTALITY PER CENT BY YEAR AND MONTH

Month	1919			1920			1921			1922			1923			Total		
	C	D	Per Cent	C	D	Per Cent	C	D	Per Cent	C	D	Per Cent	C	D	Per Cent	C	D	Per Cent
Scarlet Fever																		
January	35	4	11.0	40	3	8.0	128	22	17.0	89	7	8.0	76	5	6.6	368	41	11.1
February	39	5	13.0	47	3	6.0	144	20	14.0	88	12	14.0	51	3	5.9	369	43	11.6
March	70	3	4.3	48	6	13.0	226	13	6.0	59	16	27.0	76	5	7.0	479	43	9.0
April	64	5	8.0	51	5	10.0	186	21	11.0	126	10	8.0	89	7	8.0	516	48	9.0
May	72	6	8.0	70	15	21.0	181	11	6.0	149	7	4.0	67	2	3.0	539	41	8.0
June	72	3	4.0	55	3	4.0	132	10	8.0	143	6	4.0	90	1	1.0	492	23	5.0
July	40	2	5.0	69	4	6.0	107	6	6.0	64	1	0.0	48	1	2.0	329	14	4.0
August	19	1	5.0	41	6	16.0	34	1	3.0	32	3	9.0	20	0	0.0	146	11	8.0
September	21	1	5.0	31	2	6.0	37	0	0.0	34	1	3.0	18	1	6.0	141	5	4.0
October	20	0	0.0	35	6	17.0	39	3	8.0	25	3	12.0	11	1	9.0	130	13	10.0
November	25	1	4.0	47	3	6.0	34	5	15.0	34	6	17.0	16	2	13.0	156	17	11.0
December	49	0	0.0	80	19	24.0	68	2	3.0	52	3	6.0	26	0	0.0	275	24	9.0
Total	526	31	5.9	614	75	12.0	1,316	114	8.7	895	75	8.0	589	28	4.8	3,940	323	8.1
Diphtheria																		
January	194	41	21.0	191	40	21.0	232	36	16.0	117	29	24.0	96	18	19.0	830	164	19.8
February	196	64	33.0	204	51	25.0	212	52	25.0	187	50	27.0	91	10	11.0	890	227	25.6
March	272	63	23.0	222	47	21.0	192	28	15.0	194	49	25.0	103	12	12.0	983	199	20.2
April	267	56	21.0	217	32	15.0	195	29	15.0	213	46	22.0	126	21	17.0	1,019	184	18.1
May	291	69	24.0	198	29	15.0	212	32	15.0	207	34	16.0	131	21	16.0	1,039	185	17.9
June	206	30	15.0	179	12	7.0	153	19	12.0	145	20	13.0	112	23	21.0	795	104	13.0
July	199	22	11.0	165	10	6.0	116	7	6.0	119	17	14.0	94	5	5.0	693	61	8.8
August	128	14	11.0	92	10	11.0	79	7	9.0	109	9	9.0	83	2	3.0	491	42	8.6
September	75	10	13.0	72	10	14.0	96	7	7.0	88	11	12.0	39	6	15.0	370	44	11.6
October	114	8	7.0	85	8	9.0	81	8	10.0	82	7	8.0	85	5	6.0	447	36	8.1
November	116	20	17.0	176	29	16.0	111	14	13.0	105	13	12.0	70	6	9.0	578	82	14.2
December	150	28	19.0	177	30	17.0	138	21	15.0	84	14	16.0	92	6	7.0	641	99	15.2
Total	2,208	425	19.2	1,978	308	16.0	1,818	260	14.0	1,650	299	18.0	1,122	135	12.0	8,776	1,427	16.2
Measles																		
January	8	1	3.0	233	32	14.0	25	7	28.0	111	38	34.0	21	2	10.0	398	80	22.6
February	16	1	6.0	166	29	18.0	31	3	9.0	149	26	17.0	33	5	15.0	395	64	16.0
March	22	3	14.0	176	43	26.0	38	2	5.0	228	50	26.0	51	3	6.0	517	110	21.0
April	44	9	20.0	151	18	12.0	45	2	4.0	211	56	27.0	72	9	13.0	523	94	18.0
May	76	8	10.0	106	16	15.0	57	4	7.0	201	45	22.0	137	19	14.0	577	92	15.7
June	77	7	9.0	84	7	8.0	40	3	8.0	136	33	24.0	118	14	12.0	455	64	14.0
July	41	4	10.0	25	1	4.0	39	3	8.0	56	8	15.0	72	4	6.0	233	20	8.6
August	34	2	6.0	22	0	0.0	21	1	5.0	18	0	0.0	21	3	14.0	116	6	5.2
September	27	0	0.0	10	0	0.0	8	0	0.0	8	0	0.0	20	0	0.0	73	0	0.0
October	18	0	0.0	4	0	0.0	4	0	0.0	18	1	6.0	10	1	10.0	54	2	3.7
November	43	4	9.0	5	1	20.0	12	1	8.0	11	1	9.0	38	4	11.0	109	11	10.0
December	100	19	20.0	23	1	4.0	54	8	15.0	11	2	18.0	83	10	8.0	271	49	15.0
Total	506	58	11.5	1,006	148	14.7	374	34	8.8	1,158	269	23.2	676	74	11.1	3,720	583	15.7

TABLE B

CASES, DEATHS AND MORTALITY PER CENT ACCORDING TO AGE OF PATIENT FOR THE YEARS 1919–1923, FOR SCARLET FEVER, DIPHTHERIA AND MEASLES

Scarlet Fever

Age Group	1919 C	1919 D	1919 Per Cent	1920 C	1920 D	1920 Per Cent	1921 C	1921 D	1921 Per Cent	1922 C	1922 D	1922 Per Cent	1923 C	1923 D	1923 Per Cent	Total C	Total D	Total Per Cent
Under 6 mos.	2	1	50.0	5	3	60.0	9	2	22.0	8	0	0.0	0	0	0.0	24	6	25.0
7–12 mos. ...	5	3	60.0	6	4	67.0	8	4	50.0	7	2	29.0	5	3	60.0	31	16	50.0
13–36 mos. ..	42	6	14.0	48	19	38.0	82	16	19.0	56	15	27.0	33	8	24.0	261	64	24.0
3–5 yrs.	161	12	7.0	186	29	16.0	313	47	15.0	219	24	11.0	122	12	10.0	1,001	124	12.0
6–10 yrs.	157	5	3.0	183	12	7.0	421	16	4.0	301	17	6.0	192	2	1.0	1,254	52	4.1
11–15 yrs. ...	47	1	2.0	65	2	3.0	165	6	4.0	100	1	1.0	79	1	1.0	456	11	2.4
16–20 yrs. ...	37	0	0.0	25	0	0.0	85	4	5.0	69	3	4.0	52	1	2.0	268	8	3.0
21 yrs. & over	66	0	0.0	91	6	7.0	214	15	7.0	123	8	6.0	106	1	1.0	600	30	5.0
Not stated ...	9	3	33.0	5	0	0.0	19	4	20.0	12	5	3.0	0	0	0.0	45	12	24.0
Total	526	31	5.9	614	75	12.0	1,316	114	8.7	895	75	8.2	589	28	4.8	3,940	323	8.1

Diphtheria

Under 6 mos.	54	18	33.0	29	7	24.0	25	13	50.0	38	10	26.3	27	8	30.0	173	56	32.3
7–12 mos. ...	155	63	41.0	77	39	50.0	47	22	47.0	82	31	37.8	38	13	34.0	399	168	42.3
13–36 mos. ..	488	165	34.0	391	128	33.0	344	95	28.0	336	120	36.0	208	42	20.0	1,766	550	31.2
3–5 yrs.	644	119	18.0	652	94	14.0	652	88	14.0	558	93	16.5	387	47	12.0	2,893	441	15.6
6–10 yrs.	391	39	9.0	439	26	6.0	376	31	8.0	287	22	7.6	208	15	7.0	1,701	133	7.7
11–15 yrs. ...	100	5	5.0	118	3	3.0	102	1	1.0	79	5	6.3	48	1	2.0	447	15	3.4
16–20 yrs. ...	80	2	2.0	78	2	3.0	51	0	0.0	60	2	3.3	45	1	2.0	314	7	2.2
21 yrs. & over	249	5	2.0	193	9	5.0	221	10	5.0	195	9	4.6	160	8	5.0	1,018	41	4.0
Not stated ...	47	9	19.0	1	0	0.0	0	0	0.0	15	7	46.6	1	0	0.0	65	16	24.6
Total	2,208	425	19.2	1,978	308	16.0	1,818	260	14.0	1,650	299	18.0	1,122	135	12.0	8,776	1,427	16.3

Measles

Under 6 mos.	4	0	0.0	26	10	38.0	6	1	7.0	24	10	42.0	20	8	40.0	80	29	36.4
7–12 mos. ...	46	18	39.0	89	36	40.0	14	3	21.0	86	48	56.0	62	19	31.0	297	124	41.7
13–36 mos. ..	140	24	17.0	264	64	24.0	83	17	20.0	348	133	38.0	184	37	20.0	1,019	275	27.1
3–5 yrs.	158	5	3.0	318	27	8.0	124	7	5.0	386	62	16.0	208	6	3.0	1,194	105	8.9
6–10 yrs.	78	8	12.0	188	3	2.0	88	3	4.0	193	12	6.0	104	0	0.0	651	27	4.1
11–15 yrs. ...	11	2	18.0	23	0	0.0	7	1	13.0	14	0	0.0	15	1	6.0	70	4	5.7
16–20 yrs. ...	11	0	0.0	30	3	10.0	16	2	13.0	36	0	0.0	24	2	8.0	117	7	6.0
21 yrs. & over	52	1	2.0	55	2	2.0	35	0	0.0	61	0	0.0	56	1	2.0	259	5	1.9
Not stated ...	6	0	0.0	13	3	23.0	1	0	0.0	10	4	40.0	3	0	0.0	33	7	21.0
Total	506	58	11.5	1,006	148	15.0	374	34	9.0	1,158	269	23.0	676	74	11.0	3,720	583	15.7